July 3, 1950

MIDYEAR REVIEW AND FORECAST ISSUE

STEEL

The Magazine of Metalworking and Metalproducing

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Less scuffing and scoring in sheet levellers, with TIMKEN® bearings as back-up rolls

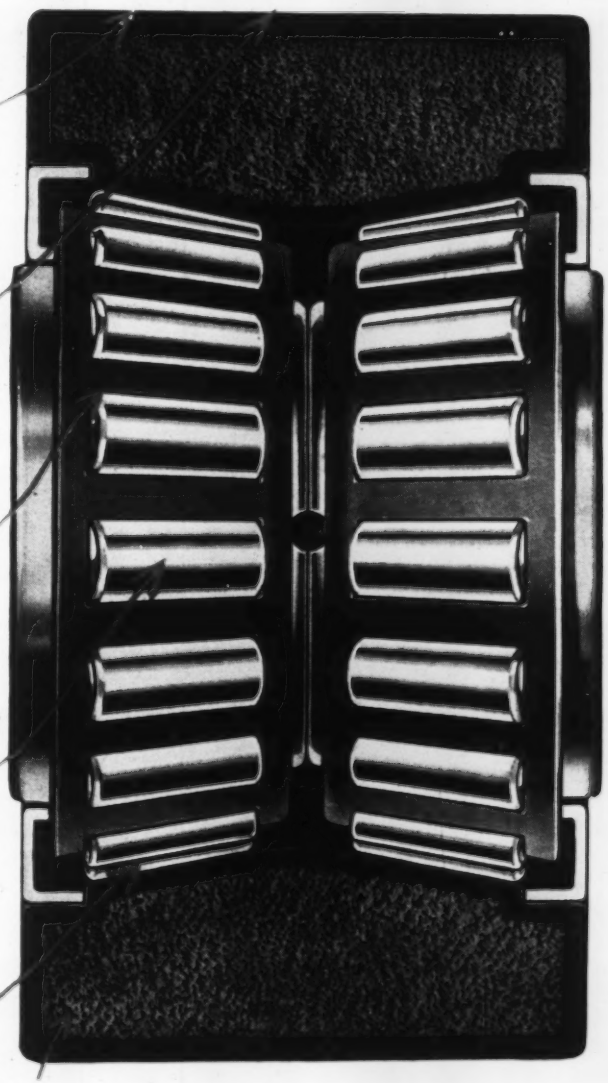
Surface is finished to 15 micro inches

Outer race of bearing itself forms the back-up roll

Friction practically eliminated

Tapered design reduces end-movement

Line contact between rollers and races gives extra load capacity



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Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Metalworking Yearbook issue $2.00. Copyright 1950 by the Penton Publishing Co.

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 127 NO. 1 JULY 3, 1950

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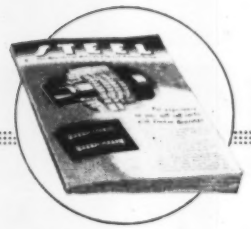

July 3, 1950

Fateful Decision

Tuesday, June 27, 1950, will go down in history as the day on which the United States of America made a fateful decision which will influence the course of world affairs for generations. Our nation is committed to providing military aid to a small republic to help it repulse a ruthless agressor. Not only that, but we have served notice that we will similarly aid in other areas where aggression is threatened.

This positive action, provoked by the invasion of South Korea by Northern Korean forces, is in sharp contrast to our behavior in similar instances in the past. When Japan invaded Manchuria on Sept. 19, 1931, we deplored the act but did nothing of consequence to correct it. Again on Oct. 2, 1935, when Italy invaded helpless Ethiopia, we assumed a "hands off" policy. Less than six months later, when Germany under Hitler invaded the Rhineland on Mar. 7, 1936, we were shocked and grieved but we took no effective action.

As a result of these and other gestures of appeasement, we were forced later on to participate in the devastating World War II. The important lesson in this is that once the leading nations of the world permit an aggressor to get away with a minor theft, that initial success encourages the aggressor to try again on a grander scale and this process leads inevitably to world-wide war.

Last Tuesday the United States, profiting from the dismal experience of appeasement, embarked upon a new policy of trying to stamp out aggression in its early stages with the hope that such positive action will prevent an all-out war. The decision involves calculated risks. It could provoke a hot war immediately, but this seems unlikely. If the aid authorized Tuesday can be made effective in sufficient volume and in time, the attack south of 38 degree parallel can be quelled, Russia's bluff can be called and all future attempts at aggression can be made infinitely more hazardous.

This is a big "if." It is big because of grave past errors in foreign policy. The outcome of this tremendously important decision transcends all other problems confronting the metalworking industries. It will shape the destiny of our way of life.

* * *

EXECUTIVES CONFIDENT: During the past few weeks the editors of this publication have been querying executives in the metalworking industries as to the business outlook for the short-term future. Returns from their questionnaires are definitely optimistic. For instance, those who manage metalworking companies think that sales in 1950 will exceed those of 1949. They look for a gross of $80 billion in 1950, compared with $72.2 billion in 1949 and $73.6 billion in the peak war year of 1944.

There are two things to keep in mind when reading the details of this round-up of opinion regarding the future outlook of business. One is that the actual performance for the first half of 1950 far exceeds the estimates of most authorities and that many prognosticators who six months ago hedged on the second-half now are saying it may be as good as the first-half or better. The second reservation is that the executives queried had no way of knowing that the Korean incident would bob up in the closing days of June. Their answers were predicated on the foreign situation as it existed in early or mid-June.

Significant is the fact that 83 per cent of the

(OVER)

executives consulted do not expect a depression within the next five years. Apparently they think new elements in our economy will prevent sharp dips in the business cycle such as we experienced in the twenties and thirties. This is important if true. —pp. 53-60

* * *

REVISING PRICE INDEX: Now that the consumers price index compiled by the Bureau of Labor Statistics has become an important factor in employer-employee contracts and in other business matters affected by the changing value of the dollar, it is important that it reflect accurately the average buying experience of consumers. This means that the index must be revised periodically.

For instance, the index is based largely on a study of consumer spending from 1934 to 1936. These were depression years and people were not buying the same things then that they do now. In fact, today's average family is buying a number of things that weren't even on the market in the middle thirties. BLS is studying new data on consumer buying and will determine what prices and what weightings should go into a revised index which will be ready July 1, 1952. The revisions will not destroy the continuity of the index, which goes back to before World War I. —p. 62

* * *

NEW EXTRUSION PLANT: Babcock & Wilcox Tube Co. announces construction at Beaver Falls, Pa. of a new million dollar extrusion plant involving a process for fabricating tubes of ferrous metals and alloys that is new to the United States. The plant is the outcome of a licensing agreement between B & W and Comptoir Industriel d'Etirage & Profilage de Metaux of Paris, France.

The process provides a method of fabricating alloys which are difficult or impossible to fabricate by the rolling or forging methods in use today and makes it possible to produce hollow and solid sections of complicated shapes. The key to the process is a new idea of lubrication of hot metal which solves the problem of lubrication and thermal insulation of the die and ingot holder. The extruding operation is carried out in a few seconds and at constant temperature, giving the extruded product uniform mechanical characteristics throughout its length.

The process, which was developed during World War II, is in commercial operation at a plant in Persan, France. —p. 61

* * *

TITANIUM IN ORDNANCE: Representatives of industry and Army Ordnance are studying the first application of pure titanium to ordnance. It is a base plate for the 81-millimeter mortar. It is a round concave disk which sets on the ground with the concave side up. Radial fins are welded to the under side. In the center of the upper side is a pivot on which the mortar rests. The plate was fabricated at the Bureau of Mines Laboratory at College Park, Md., of ⅛ to ⅜-inch titanium plate produced at the Bureau's station at Boulder City, Nev.

The project was undertaken to demonstrate the feasibility of using titanium for parts that must be tough and light. A mortar base plate of steel weighs 47 pounds whereas one of titanium weighs 24 pounds. —p. 65

* * *

GETTING OUT THE VOTE: Rowland Jones Jr., president of the American Retail Federation, is enlisting the nation's 1.8 million retail establishments in a campaign to urge citizens to vote at the November elections. The drive is nonpartisan and is based upon the theory that the election results will be sounder if a larger proportion of qualified voters actually will vote. "Failure of over 48 per cent of the qualified voters to vote in 1948 is an indictment of all of us," says Mr. Jones.

He points out that in 1948 Ohio was carried by 6817 votes, Illinois by 33,612 and California by 32,512. The result is Ohio would have been changed by a difference of one vote per precinct and in Illinois and California by a difference of two votes per precinct. Getting out a more representative vote should be a crusade in which every segment of the nation, including industry, should participate vigorously. —p. 65

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

WHAT'S AHEAD?—Metalworking has a record sales volume of $38.1 billion under its belt for the first half and can expect to do more than $41 billion worth of business in the next six months. The consensus among metalworking executives and economists, presented in STEEL's Midyear Review and Forecast (pp. 53-60), is that industry will do a record $80 billion for the year unless there is war. If the Korean flareup won't die down, 1950 activity will be even higher. The Federal Reserve Board's production indexes will stay between 190 and 195 for the rest of the year. Estimates of the gross national product range from $260 to $270 billion for the year. Prices will continue to inch upward. Steel ingot production may hit a record 92 million tons. Between 7.2 million and 7.5 million cars and trucks will be built in the U. S. and Canada this year. The building industry may put more than $20 billion worth of new construction in place in 1950.

STATISTICAL TINKERING—Look for a model change in the Bureau of Labor Statistics Consumers' Price Index (p. 62). The present indicator, calculated and weighted under depression conditions, is getting dated. General Motors, for example, has tied its wage contract to the index for another five years. BLS hopes to have a revised version ready July 1, 1952. The changes won't destroy the continuity of the present index which goes back to before World War I.

ONWARD AND UPWARD—The flurry of expansions in the auto industry is designed to cut costs, not to expand capacity much (p. 67). Studebaker will build a $5.5 million assembly plant in New Brunswick, N. J. Oldsmobile will buy over 100 new machine tools to increase production capacity for its V-8 engine. Chrysler may expand its giant press plant.

RAILROADS' DILEMMA—Railroads have hiked their freight rates 61 per cent since before the war, partly to offset financial losses from passenger service (p. 70). In so doing, they have contributed to their undoing because freight volume has dropped. A Senate committee is studying the problem. The group's object: To find ways to keep the railroads on a sound basis, particularly in case of war.

BUSTED BRITCHES—Because money wasn't available when he decided to go into business in the midst of the depression, Jack Trantin, president and principal owner of Youngstown Alloy Casting Corp. literally dug some up. To start his now enterprising steel plant that makes such things as bar mill guides and tube mill plugs, he got some old bricks from a slag dump near Niles, O., borrowed a trailer to get discarded cranckcase oil to use for fuel and built an open-hearth furnace in his backyard. His company, now busting its britches in the current steel boom, is a model steel foundry in Youngstown (p. 71).

FOR A COMPLEX SITUATION—Babcock & Wilcox is going to build a $1 million plant near Beaver Falls, Pa., to fabricate carbon and alloy steel tubing in many complex forms (p. 61). B & W is licensed by a French company that developed the process during the war. The process makes possible the forming of shapes that can't be manufactured by forging or rolling. The secret lies in the method of lubricating the hot metal.

HERE AND THERE IN INDUSTRY—The tieup in Canada between Reo and Kaiser-Frazer has prompted rumors that there will be a joint distributing setup in the U. S. for Reo trucks and K-F cars (p. 68) . . . B. F. Goodrich President John L. Collyer says U. S. industry should spend up to $200 billion in the next decade for expansion and modernization (p. 61) . . . American Society for Testing Materials met in Atlantic City, N. J., last week (p. 71) . . . American Steel & Wire Co. will install facilities to clean blast furnace gas at its Donora, Pa., works (p. 61) . . . GM's Frigidaire Division will spend $12 million on a plant expansion near Dayton, O. (p. 72).

Production-Engineering News—p. 81 Market Summary—p. 119

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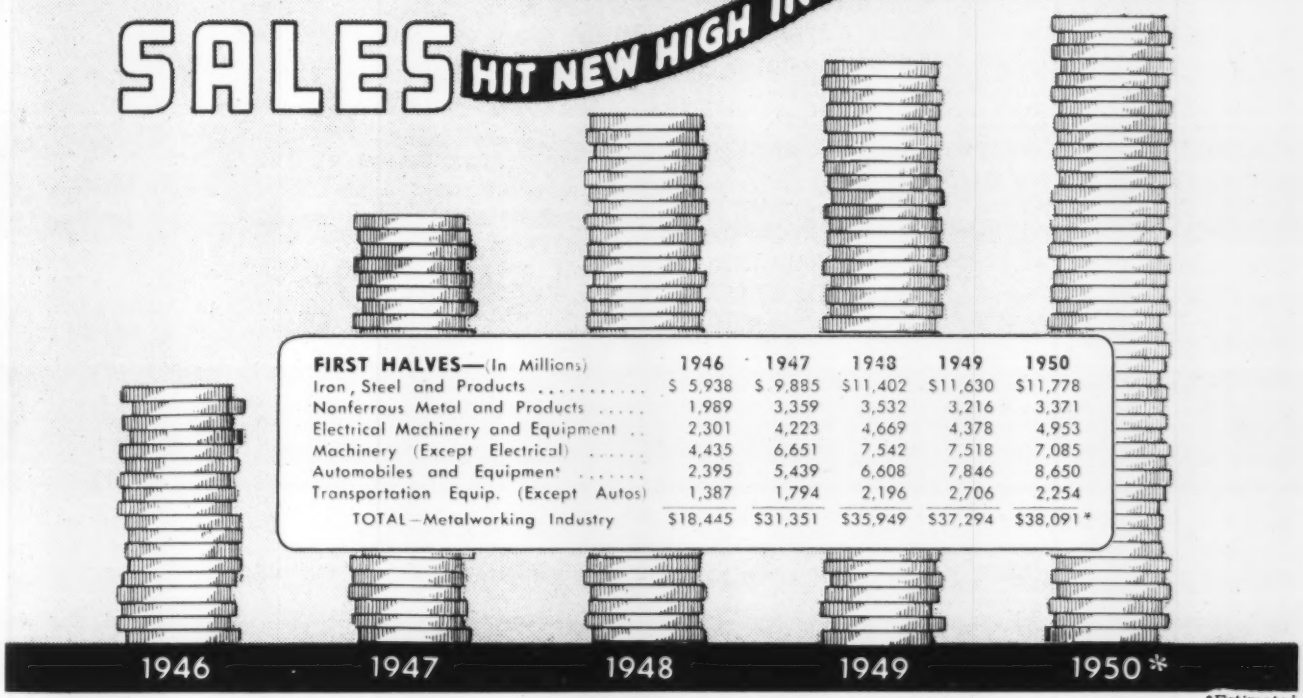
STEEL
A PENTON PUBLICATION
July 3, 1950

METALWORKING

What It's Doing—What to Expect

OVER $38 BILLION

SALES HIT NEW HIGH IN FIRST HALF OF 1950



FIRST HALVES—(In Millions)	1946	1947	1948	1949	1950
Iron, Steel and Products	$ 5,938	$ 9,885	$11,402	$11,630	$11,778
Nonferrous Metal and Products	1,989	3,359	3,532	3,216	3,371
Electrical Machinery and Equipment	2,301	4,223	4,669	4,378	4,953
Machinery (Except Electrical)	4,435	6,651	7,542	7,518	7,085
Automobiles and Equipment*	2,395	5,439	6,608	7,846	8,650
Transportation Equip. (Except Autos)	1,387	1,794	2,196	2,706	2,254
TOTAL—Metalworking Industry	$18,445	$31,351	$35,949	$37,294	$38,091*

*Estimated

AN AERODYNAMICS theorist once proved that bumble bees can't fly. But bumble bees couldn't understand him, and they're flying anyway.

Six months ago economists and metalworking men agreed that 1950 would be good economically but that it wouldn't compare with 1948 or 1949. Now, 1950 promises to be metalworking's best year in history, war or no war.

Better and Better — Metalworking sales for the second half will exceed $41 billion and for the year will soar to the alltime high of about $80 billion, compared with $72.2 billion in 1949, $75 billion in 1948 and $17.7 billion in 1939 (see the sales chart). The $41 billion estimate for the second half, compared with $38.1 billion for the first, is projected partly on the basis of a survey by STEEL revealing that metalworking men think their business will be 13 per cent better in the second six months than in the first (see the chart on page 55 for poll results).

Professional economists are less optimistic. The consensus among them is that the second half will be the same or a shade poorer than the first. They say the Federal Reserve Board's seasonally adjusted industrial production index will be between 190 and 195 for the rest of the year. This table shows that

INDUSTRIAL PRODUCTION INDEXES

1935-39=100

	Total Production			Iron and Steel			Nonferrous		
	1950	1949	1948	1950	1949	1948	1950	1949	1948
Jan.	183	191	193	203	228	203	179	184	195
Feb.	181	189	194	201	232	203	188	185	199
Mar.	187	184	191	205	233	207	199	183	201
Apr.	190	179	188	222	219	177	198	168	200
May	193	174	192	234	204	208	202	145	196
June*	195	169	192	233	177	208	202	132	193
6 mos. ave.	188	181	192	216	216	201	195	166	199

Federal Reserve Board

*Preliminary

is about the same as it has been for the last quarter.

All these predictions are subject to sharp upward revision if the U. S. gets into a major war.

Going Up—For the year, economists' estimates of the gross national product range from $260 billion to $270 billion. It was $258.6 billion in 1949, $262.4 billion in 1948 and $91.3 billion in 1939 (see the chart at the bottom of this page).

The professional economists and the metalworking estimators are even further apart on the long-term business prospects. The professionals think a decline will come by about 1953. Look at the poll results (on page 55) and you'll see that more than 53.2 per cent of the companies participating in the survey think their business will improve over the next five years.

What Happened?—Why and how did the experts and metalworking executives themselves underestimate the economy for 1950? Probably because of these five factors that were either not foreseen or not given enough weight:

1. The $3 billion in insurance dividends disbursed to veterans was a fillip to the economy that was given insufficient emphasis. For one thing, the refunds originally were to have been distributed over most of 1950. Political pressure dictated that nearly all be sent out in the first half. Many veterans rushed to spend the windfall on home appliances or towards a down payment on a new car or house.

2. Both professional and amateur economists failed to foresee the "now or never" consumer buying philosophy fostered by war scares. Direct military buying, although expanding, is still just a tear drop in the metalworking ocean, but the psychological impact on consumer buying is terrific.

3. The steel strike effects were figured into economic calculations for 1950, but the protracted coal and Chrysler strikes could not have been foreseen. These three big strikes plus many other small ones served to extend product shortages. Scarcities are like a fire to move a balking horse. The strikers lost earning power, that's true, but that effect on the economy has been slight compared with the spurt given by the psychology of shortages.

4. However ominous the long-range consequence of government inflationary policies, the short-term effects are exhilarating, economically. Federal deficit spending is giving the economy a more potent economic jag than was expected. The gross federal debt now exceeds $256 billion, compared with $251 billion a year ago.

5. No one of the foregoing factors alone could have turned the tide to give us the year we now are experiencing, but the four in combination did the trick. What's more, those four factors helped generate a fifth: A self-feeding optimism and a feeling that you must keep up with the Joneses, industrially.

The Other Side of the Coin—The effects of all five of those factors are bolstering the economy and probably will continue to do so for the rest of the year. But all is not rosy. Some analysts are uneasily aware that these five factors could also undermine our foundations quickly:

1. A decision by the government to tighten up on credit and try a little deflationary activity for a while.

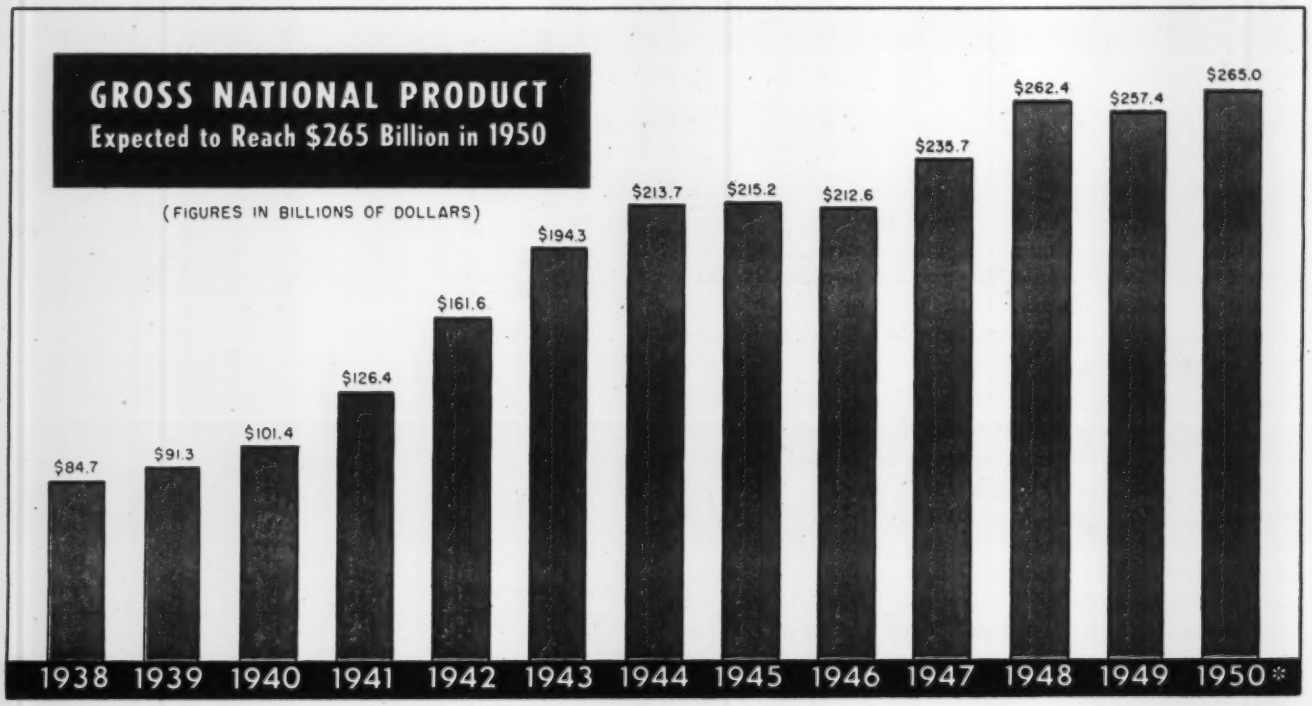
2. Overextension of consumer credit, with banks and other private credit agencies tightening up their lines.

3. Inventory shakeouts.

4. Materials shortages.

5. Rising prices.

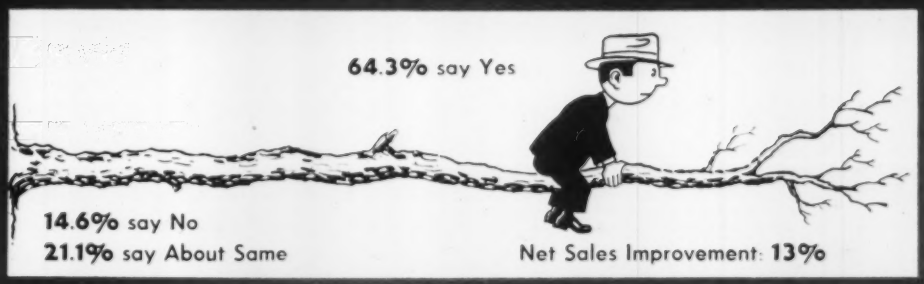
Unpredictable — It's highly unlikely that federal



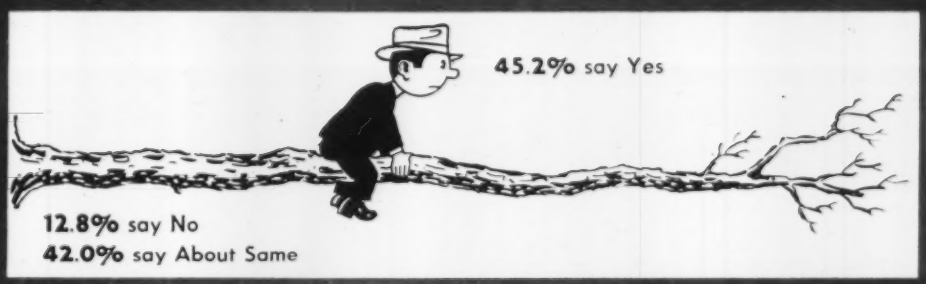
* Estimated

Metalworking Executives Go Out on a Limb

Will second half of 1950 be better than first half?



Will 1951 be a better year than 1950?



Expect improvement over next five years?

fiscal policies will be deliberately steered on a deflationary course, but who knows what the administration will do? The slump a year ago was caused partly by just such federal fiscal moves.

The administration's fiscal planners then thought a little "disinflation" was needed, so they pressed gently on the brakes. But the brakes grabbed and the economy slowed down much more than expected. If any more "disinflation" comes now, it will probably be accidental.

The Easy Payment Plan—Some economists are already alarmed at the phenomenal growth of consumer debt in the past six months. At the end of April it was $18,629 million, the highest in history, $285 million higher than at the end of January and $3034 million above what it was a year previously. In 12 months the debt rose 19 per cent.

The significant point about that debt is this: The economy can carry it only as long as it is going at a breakneck speed. Before the war a slight slackening in the pace worked little hardship on Joe Smith who could still manage to scrape up a monthly payment for the $1000 car. Now, a slight slackening will wreck havoc on Joe who is trying to meet payments on a $2000 car, $200 automatic washer and a $300 television set.

Stock on Hand—Some analysts also think that the boom now is entering the stage of building for inventory rather than for sales, particularly in appliances, farm equipment and electric motors. The reasoning goes this way: Distributors have empty warehouses and shelves now because of the phenomenally good second, and to a lesser extent, first quarters. They need to replenish anyway and they have one other strong incentive to do so—prices are rising. The distributors then build inventories in the third quarter, to find that in the fourth their sales are off, so they in turn in the last quarter curtail their orders to manufacturers.

Proponents of that reasoning say the third quarter

STEEL PRODUCTION
Ingots and Steel for Castings

Sets New Record in First Half, 1950

	1929	1937	1944	1948	1949	1950
January	5,115,730	5,398,426	7,592,605	7,480,878	8,183,495	7,930,372
February	4,920,862	5,050,917	7,194,011	6,948,017	7,480,724	6,793,245
March	5,761,480	5,970,357	7,826,259	7,618,770	8,387,927	7,487,036
April	5,627,198	5,801,647	7,593,690	6,224,487	7,785,276	8,212,672
May	6,009,382	5,894,369	7,702,598	7,580,642	7,589,722	8,549,038
June	5,573,659	4,787,798	7,234,259	7,265,249	6,498,201	8,300,500*
Total, 6 mos.	33,008,311	32,903,514	45,143,422	43,118,043	45,925,345	47,272,863*

* Estimated

will be good, the fourth quarter—especially November and December—rather slack, barring war.

Double Edged—Materials shortages can work in two ways to affect the economy. They can jazz it up as they have been doing thus far this year. Or, if they get bad enough, they can hobble business activity as they did in 1947 and even in early 1948. It's not likely that scarcities will become as extreme as in 1947. A record steel ingot production of about 92 million tons is possible this year (see the table above). The third quarter may set alltime steel records, although the last quarter may see the ingot rate drop to as low as 85 per cent of capacity because of auto model changeovers and the seasonal drop in construction. The average rate for the year should be about 92 or 93 per cent of capacity.

But STEEL's poll shows that the metalworking industry is having shortage troubles again (see the chart at the bottom of page 57). Many companies are beating the bushes for steel, especially light flat-rolled products. The steel conversion market is active. One healthy sign: Not much gray market steel is being offered. As of June 1, steel users' inventories were about 13 per cent below the 1949 average and 40 per cent below 1939. Inventories are expressed in days' supply at current operations. Consumers can expect some relief because of the expanding steel capacity. A flurry of new construction programs announced in the past three months is assurance that the postwar expansion pace will be continued. About 3 million tons were added to ingot capacity in 1947, 2 million in 1948 and 2 million in 1949. The 1950 improvements accent new flat-rolling capacity as well as substantial ingot facilities.

Another Spiral?—If anything knocks the pins from under high metalworking activity in the second half, it probably will be rising prices. Don't look for general steel prices to go up, although there will be more minor boosts on specialty products. As of June 22, STEEL's weighted finished steel index stood at 156.58, compared with 156.13 a month ago and 152.90 a year ago. Steel prices have risen 2.4 per cent in the past 12 months.

What about general metalworking prices? About half the companies participating in the STEEL poll think their prices will go up; half think theirs will not. The overall picture: General prices will go up slightly in the second half of 1950. The consensus (see the charts on page 57) is that costs are now 3 per cent higher than in 1949. Nearly 73 per cent of the companies participating in the poll think costs

THREE METAL PRICE AVERAGES
Increased Sharply in First Half, 1950

(Copper and Zinc, Cents per lb.—Scrap, Dollars Gross Ton)

Week Ended		Copper	Zinc	Scrap*
Jan.	5	18.500	9.875	$26.83
	12	18.500	9.875	26.83
	19	18.500	9.813	26.83
	26	18.500	9.750	26.83
Feb.	2	18.500	9.750	27.33
	9	18.500	9.750	27.42
	16	18.500	9.750	27.67
	23	18.500	9.750	27.67
Mar.	2	18.500	9.750	27.33
	9	18.500	9.750	27.50
	16	18.500	9.875	28.00
	23	18.500	10.000	28.66
	30	18.500	10.167	28.75
Apr.	6	18.500	10.417	28.83
	13	18.500	10.500	29.08
	20	19.000	10.667	29.50
	27	19.500	11.000	30.17
May	4	19.500	11.208	30.92
	11	19.500	11.750	31.67
	18	19.833	12.000	33.83
	25	20.500	12.167	35.50
June	1	20.500	12.800	37.17
	8	21.667	14.500	40.83
	15	22.500	15.000	39.33
	22	22.500	15.000	39.25
	29	22.500	15.000	....

* Steelmaking Scrap Composite

Price Indexes

Wholesale Prices 1926=100

Consumers' Prices 1935-39=100

	Wholesale 1950	Wholesale 1949	Consumers 1950	Consumers 1949
Jan.	151.6	160.5	166.9	170.9
Feb.	152.7	158.1	166.5	169.0
Mar.	152.7	158.4	167.0	169.5
Apr.	152.9	156.9	167.3	169.7
May	155.2*	155.7	167.8*	169.2
June	156.7*	154.4	168.6*	169.6
Average	....	154.9	....	169.1

Bureau of Labor Statistics

*Estimated

will go higher in the second half; 27 per cent think they will not.

Sneaking Up—The consumer and wholesale price indexes of the Department of Labor on page 56 show the inflation that has already come in the first half. The trend will continue. The indexes reveal one significant thing: Wholesale prices are going up faster than consumer indicators. We're still in a buyers' market.

The purchasing power of the dollar (see the table below) is starting a decline that was checked in early 1950. Upward price trends in some nonferrous metals and iron and steel scrap mirror the inflationary forces in these basic commodities (see the chart on page 56). Even aluminum, usually a Rock of Gibraltar price-wise, has risen from 17 cents to 17.5 cents per pound. Nickel is up to 48 cents per pound, a fact that's giving pricing troubles to alloy steel producers.

Behind Rising Prices—One big reason for the nudge in prices is higher labor costs. Hourly wages of production workers in manufacturing averages $1.441 per hour, compared with the 1949 average of $1.40, $1.35 in 1948 and $0.63 in 1939. The current figure doesn't take into account the added labor costs for pensions, insurance benefits, paid vacations and paid holidays—much of which has been won by labor in the past 12 months.

Will labor costs continue to rise over the rest of the year? Labor will make no sensational gains over the next six months, but in many companies will win small wage increases, social security benefits and other fringe concessions. The net result: General metalworking labor costs will continue to inch upward.

The Case for Labor Peace—Relative labor peace seems likely for the next six months. There could be trouble in the electrical industry where the youthful IUE is flexing its muscles, but the energies of that newest affiliate of the CIO probably still will be reserved for keeping the rival left-wing UE at arms length. There are rumblings from Phil Murray about need for concessions for his steelworkers, but prospects for labor serenity in steel are good—for the next six months, at least.

Employment is flirting with the 60-million mark, should hover around it during the third quarter and fall slightly in the last quarter. Unemployment varies according to the season and the number of college and high school graduates joining the labor pool. For most of the third quarter, joblessness should be down around 3.5 million, a level not far from the minimum

Purchasing Power of the Dollar

As Measured by:

	Wholesale Prices		Consumers' Prices	
	1950	1949	1950	1949
Jan.	53.1	50.1	59.9	58.5
Feb.	52.7	50.9	60.1	59.2
Mar.	52.7	50.8	59.9	59.0
Apr.	52.7	51.2	59.8	58.9
May	51.9*	51.6	59.6	59.1
June	51.4*	52.0	59.3	59.0

U. S. Office of Business Economics

* Estimated

Metalworking Executives Report:

MANUFACTURING COSTS

71.1% Find Costs Higher than Year Ago (Averaging 3%)

28.9% Say Costs are Unchanged or Lower

72.8% Expect Further Increases

SELLING PRICES

85.1% Report No Price Increase Over 1949

50.7% Expect Price Increase in Second Half

60.8% Expect Increase in 1951

MATERIAL SHORTAGES

Steel . . .

32.0% Can't Get Enough

Aluminum Rolled Products

8.0% Report Shortage

Copper, Brass Rolled Products

7.0% Say Supply Is Short

SIX MONTHS*

1950	3,887,988*
1949	3,154,002
1948	2,634,165

(United States and Canada)

1950	PASSENGER	TRUCKS	TOTAL
January	518,024	104,743	622,767
February	403,721	98,693	502,414
March	490,776	118,446	609,222
April	473,886	111,008	584,894
May	606,792	132,899	739,691
June*	699,000	132,000	829,000
	3,192,199*	697,789*	3,887,988*

1949	PASSENGER	TRUCKS	TOTAL
January	337,937	120,312	458,249
February	337,227	110,901	448,128
March	421,627	124,473	546,120
April	449,593	114,297	563,890
May	410,487	94,591	505,078
June	519,183	113,354	632,537
	2,476,054	677,928	3,154,002

1948	PASSENGER	TRUCKS	TOTAL
January	328,148	114,782	442,930
February	284,930	115,647	400,577
March	364,953	150,270	515,223
April	318,387	142,577	460,964
May	235,752	119,759	355,511
June	328,755	130,205	458,960
	1,860,925	773,240	2,634,165

* Estimated

allowing for unemployables and for persons changing jobs. Unemployment may rise, but not alarmingly in the fourth quarter.

A Jingle in Your Jeans — All this employment means money in your pocket and in your bank account. Personal income is up, as shown here:

Personal Income in the U.S.

In Billions of Dollars at Annual Rates

	1950	1949	1948
January	218.1	214.6	206.5
February	219.1	211.3	204.1
March	222.8	210.2	204.7
April	216.9	210.5	208.3
May	216.5*	210.2	209.3
June	217.3*	209.4	213.4

U. S. Office of Business Economics *Estimated

The personal income rate now is running about 3 per cent ahead of the 1949 total and 2 to 2.5 per cent ahead of the 1948 level which was the previous alltime high.

Where's It Coming From?—Things look good, but just where does the goodness lie? STEEL's metalworking poll shows that executives think the second half will be 13 per cent better than the first of 1950 which was excellent. Is all the improvement concentrated in just one segment of metalworking, say production of primary metal products? The survey, as indicated in this table, shows that all the machinery and equipment people are the most optimistic. Electric machinery men say business will be up 20 per cent in the second half over the first. Opinion for other metalworking categories is less optimistic, the estimated improvement ranging from 6 to 9 per cent.

Will Second Half Be Better Than the First?

	YES	NO	About Same
Primary Metal Products	46.5%	23.8%	29.7%
Fabricated Metal Products	61.0%	19.3%	19.7%
Machinery Except Electric	74.7%	9.2%	16.1%
Electrical Machinery	70.9%	13.9%	15.2%
Transportation Equipment	68.9%	3.4%	27.7%
Instruments	44.1%	1.2%	54.7%

That's what can be expected for the broad product classifications in metalworking over the next six months. Narrowing your focus, what can you expect for individual metalworking industries? Here is the industry-by-industry outlook:

Automobiles — Professional economists are telling Detroit, "You can't do that," but automakers are chalking up sensational production records just the same. The most conservative analysts say the industry will produce at least a record 6.7 million cars and trucks for the year in the U. S. and Canada. In the rarified Michigan atmosphere, some automen are eyeing the 8-million mark. From 7.2 million to 7.5 million for the year looks like a good estimate.

The third quarter is expected to set new records. Schedules call for assembly of more than 2.2 million units. August should be the peak month in that period, perhaps the peak month for alltime. Model changeovers will slow down the production pace in the fourth quarter. General Motors, for example, plans to start its model shifts Nov. 1. By December, assemblies may be off 35 per cent from the present rate of about 200,000 a week.

About 3.9 million cars and trucks will be turned out in the first half (see the auto table above), perhaps 3.6 million in the second half.

Automakers' dollar sales for 1950 promise to exceed even the fabulous level of 1949 when General Motors led with a total volume of $5.7 billion, three and a half times the prewar average. Earnings, too, for the industry should equal or exceed the 1949 pace.

Construction—The auto industry must take co-star billing with the construction industry as the stellar performers for 1950. Construction made the surprise showing of 1949; it is repeating its performance in 1950. The industry put $19,250 million worth of new construction in place in 1949. That figure will be higher—$20 billion or more—for all of 1950 (see

the table below). Here's the break-down by type of construction:

The sensational private housing construction rate of over 1 million houses in 1949 will be exceeded in 1950, but the boom can't last. Expect a break in new housing construction sometime in 1951.

The continued residential construction pace depends on: 1. High personal incomes, 2. stable prices, 3. cheap and plentiful mortgage credit. Contractors can count on the first and third factors to work in their favor for the rest of the year, but only the third factor is assured for 1951, too. Chances are good but not certain that personal income will stay up in 1951. Building costs are already rising.

Demand should hold reasonably steady for commercial buildings in the next six to 12 months. High business activity, plus the need for cutting distribution costs, will create a demand for more warehouses. There should be a lot of office facility construction in the next 12 months.

The postwar peak in construction of manufacturing buildings was in 1946. Since then new construction in this category has fallen. But a marked rise started in the first quarter that is still continuing. Industrial construction in the first half was up 40 per cent over the same period in 1949.

School-age population is increasing and will continue to do so for years to come. That means more school buildings will be needed for a long period ahead.

The program to build hospitals and institutions is gaining momentum because of direct federal support and state aid.

Expenditures for public buildings have climbed each year since the war, although they fell a little in the first quarter of 1950. Although this classification is minor in the overall picture, it would be one means by which the government could prime the pump in case of a recession.

No setback is in sight for public works.

The long range outlook for public utility construction is good. New building in this class increased in the first quarter of 1950. The upward trend will continue.

Containers—About 28 billion cans were made last year. That figure should be exceeded for 1950. Metal has a competitive advantage over glass because the cost of moving a metal can is about one-eighth that of moving glass. Beer producers are using more cans. Memo to inventors: Develop a good beer can that may be used again, and you'll make your fortune.

Railroad Equipment—Freight car purchases will increase in the second half compared with the first, partly because of the new leasing schemes. But freight car production for the whole year is not expected to exceed 55,000, compared with the 92,562 turned out in all of 1949.

In the first six months of this year, only about 11,500 cars were delivered. As of June 1, freight car backlogs amounted to 42,300. It usually takes three to five months to work off orders on hand. Buying over the remainder of the year will include a substantial number of gondolas and box cars. Diesel locomotive sales are good.

All in all, the outlook for this industry is about the poorest in all the metalworking field. But prospects still are better than they appeared to be six months ago.

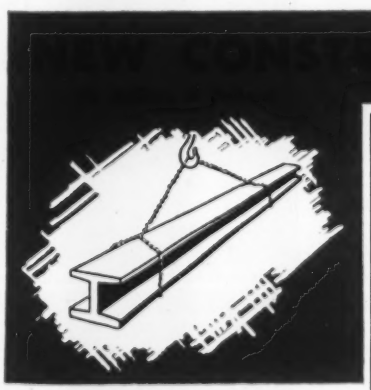
Machinery and Tools (Except Electrical)—Industrial expenditures for equipment other than electrical this year should exceed the 1949 level which was only fair. STEEL's poll shows that makers of this equipment think their second half will be 8 per cent better than the first because:

1. New orders for metalworking machinery rose sharply in the first half. Consequently, operations in the second will be active.

2. The high rate of industrial construction in the first half means that equipment is needed to operate the new plants.

3. The pressure to cut costs is mounting as labor and material charges mount. One good way to cut costs is with modern equipment.

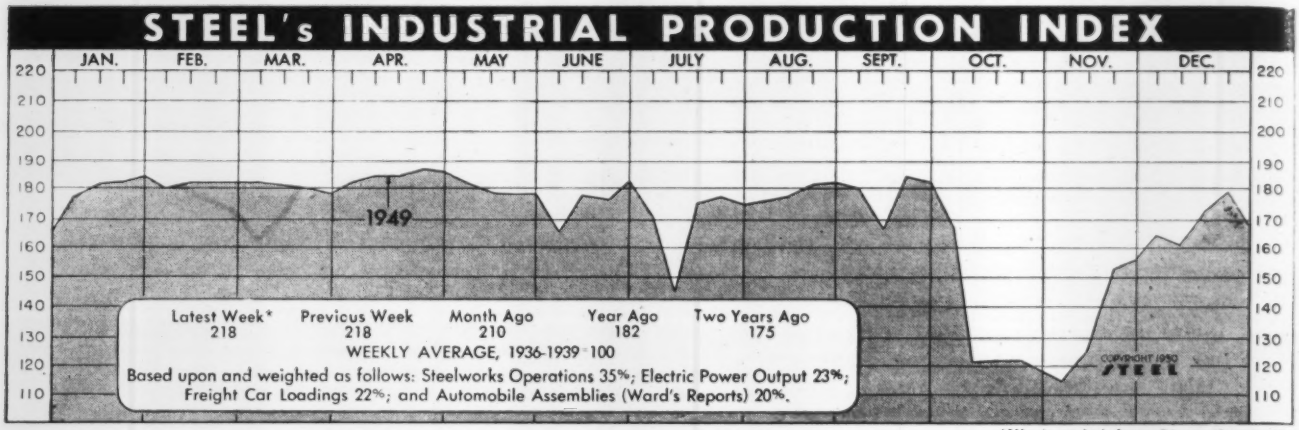
Major improvements will come in materials handling devices, fabricating equipment and steel mill equipment. Makers of materials handling equip-



TION ACTIVITY

	PRIVATE			PUBLIC			TOTAL		
	1950	1949	1948	1950	1949	1948	1950	1949	1948
January	1,139	1,002	974	357	291	206	1,496	1,293	1,180
February	1,068	905	875	327	267	174	1,395	1,172	1,049
March	1,155	951	1,001	385	316	225	1,540	1,267	1,226
April	1,254	989	1,099	448	381	279	1,702	1,370	1,378
May	1,410	1,108	1,222	531	468	350	1,941	1,576	1,572
June	1,530*	1,229	1,348	540*	506	406	2,070*	1,735	1,754
TOTAL—6 mos.	7,556*	6,184	6,519	2,588*	2,229	1,640	10,144*	8,413	8,159

* Estimated. Source—Departments of Commerce and Labor.



*Week ended June 24 (preliminary)

ment expect a $1 billion sales year, up a third from 1949. Machine tool manufacturers don't think their business will improve that much in 1950, but it will be better than 1949. Machine tool sales bounded to new highs in May and June.

Electrical Machinery—A clue to the economic prospects for electrical machinery is motor sales. General Electric and Westinghouse are producing integral motors (1 to 2000 hp) at a dizzy pace. STEEL's poll shows that electrical manufacturers themselves think sales in the second half will be 20 per cent above the first. Even if that proves too optimistic, a good bet is that the second half sales will exceed the first half's and that the performance for the year will top 1949's.

Despite a protective buying spurt preceding a price increase in the first quarter, orders for integral motors during May were 19 per cent above the average for the first five months this year and were 49 per cent above the 1949 average. Orders for the first four months this year for fractional horsepower motors were 92 per cent above the 1949 average.

New plant construction is a boon to electrical machinery makers because new electrical equipment is needed to operate the factories. The building pace promises to continue for the rest of the year.

A second factor bolstering demand is an about-face by electric utilities. In the middle of last year, utility people got nervous about the slump and shelved many of their expansion projects. Since then they have realized their miscalculation and are reordering. The electrical energy consumed per unit of production continues to rise.

Household Appliances—The outlook for appliances depends on whom you ask. Some think the saturation point is already here—it's an unusual buyer that can't get a washer or some other item at a discount. Other analysts say that this year's sales should be about 10 to 14 per cent ahead of last year's and that business will improve over the next five years—more slowly than in the immediate postwar period, but more steadily than before the war. The population growth is the basis for much of that optimism.

Electric appliance production was sensational in the second quarter, a hint that the prewar demand pattern is returning. Before the war about 40 per cent of yearly sales for most appliances were made in the second period. No one knows exactly why.

The much publicized popularity of television, of course, accounts for a good deal of the appliance gain. Another relatively new product bolstering the sales picture is the automatic clothes dryer. Its sales gains have been steady, but not spectacular.

Farm Equipment — For farm machinery makers, everything depends on the farm income. Right now it's off slightly from 1949, and implement makers are figuring on parallel sales that will be off slightly from 1949. The big operators in farm equipment manufacturing aren't too worried about the prospects. The newer, smaller makers will be hit the hardest. Everybody is fairly optimistic because at the beginning of the year the consensus was that 1950 sales would skid 10 or 15 per cent from the 1949 level. It won't be that much.

Unlike the situation in most other segments of metalworking, dealers' stocks of farm tools are high.

Construction Equipment—Sales for the rest of the year should stay at the good levels of the first half.

Shipbuilding—Outlook is poor unless war comes.

Aircraft—Look for an improvement in the second half over the first because of Korean developments. Even if the Korean outbreak hadn't occurred, military ordering would have boosted the industry's 1950 sales above the 1949 level. Lockheed, Bell, Boeing, Martin and others are expanding and tooling up to produce jet aircraft and guided missiles.

Ordnance—It has been a drop in the bucket. Future depends on Kremlin.

Exports—Exports of all metalworking products will continue the decline noted in the first half because of dollar shortages and the effects of devaluation. Steel exports for the year will be 30 per cent less in 1950 than in 1949. General imports of metalworking products will continue the rise started in the first half, but the overall effect on domestic producers will still be slight. Steel imports are rising, but the effects are felt mainly in coastal areas.

Tubing by Extrusion

Babcock & Wilcox to make complex sections in carbon and alloy steel under French process

A NEW $1 million extrusion plant for fabricating tubes of ferrous metals and alloys in complex sectional shapes will be built by Babcock & Wilcox Tube Co. at Beaver Falls, Pa.

The process to be used was developed by Comptoir Industrial d'Etirage & Profilage de Metaux of Paris, France, during the war. B&W has just completed a licensing agreement with the French company.

Other American producers are reported interested in the process and are negotiating with the patent holders.

Impossible Made Possible — The process offers a method of fabricating alloys that are difficult or impossible to fabricate by the rolling and forging methods in use in this country today. It makes possible the production of hollow and solid sections of complicated shapes.

Key to the process is a new concept of lubrication of hot metal that solves the problem of lubrication and thermal insulation of the die and ingot holders. The extruding operation is carried out in a few seconds at constant temperature, giving the extruded product uniform mechanical characteristics throughout its entire length.

France Does It — Isaac Harter, B&W chairman, says the new plant will be built at the site of the company's present facilities. B&W now manufactures seamless and welded tubing. The new process will be used primarily in making carbon and alloy tubes in various sectional shapes. The process is in commercial operation at the Persan, France, plant of C. I. E., a subsidiary of the Societe d'Electro-Chimie, d'Electro Metallurgie et des Acieries Electriques d'Ugine, where it was developed.

Quantity Can Discounts Out

Quantity discounts in the sale of cans by the American Can Co. are prohibited by a ruling handed down by the Federal District Court for northern California. The decision resulted from an antitrust action brought by the Federal Government. A similar decision is expected to be handed down against Continental Can Co.

The court decree prohibits American Can from entering into requirements contracts except on a one year basis and prohibits the company for five years from any other contract which can not be fulfilled in a one year period. Contracts must be made on the basis of individual canning plants of each customer rather than as a single contract with a large canner whose plants are scattered throughout the country. The can-making firm is also ordered to sell can closing machines during the next ten years to any canner who wishes to buy them instead of just leasing them to those companies who buy from American Can.

RAZOR BLADES: The new Dearborn Economy plow has shares that can be used and discarded like razor blades. Dearborn Motors, Detroit, developed them to help farmers cut plowing costs. "Razor blade" shares are used until they are dull. They are then discarded. The method, say Dearborn men, can save farmers as much as $40 per 100 plowed acres when compared with the cost of sharpening conventional shares

Worth a Try, Thought Worth

The other fellow often is a pretty good guy when you get to know him. So it might pay to know him, particularly when you have to deal with him.

With that thought in mind, Worth Steel Co., Claymont, Del., played host at its Claymont plant to scrap dealers from the Philadelphia and Chester, Pa., and Wilmington area. Such an occasion could produce two-way benefits, Worth reasoned. Worth would get to know the scrap dealers; the scrap dealers would get to know Worth. So to get to know each other, Worth's operational personnel and the scrap men discussed mutual problems. Afterward the scrap men were taken on a tour of the plant. Topping off the day was a dinner at a Wilmington hotel. Worth picked up the tab.

$200 Billion Needed for Growth

Capital investments totaling up to $200 billion will have to be made by industry in the next decade if the United States is to achieve the productivity needed to maintain its high standard of living, says John L. Collyer, president, B. F. Goodrich Co., Akron. This total nearly equals investments in the last 30 years.

Most of the expected population increase in the next ten years will come in age groups either below 18 or over 60, he explains, and this means the working group will have to support, directly or indirectly, the largest number of people in history. "The only answer," Mr. Collyer says, "is to provide every American worker with more effective tools so that we can produce and distribute, in vastly increased volume, goods and services for the American people."

Steel & Wire To Clean Gas

American Steel & Wire Co., U. S. Steel subsidiary, will install the latest equipment for washing blast furnace gas in its Donora, Pa., works.

Harold Cope, general superintenddent of Donora Works, said the new gas washer will replace the present equipment with the best facilities available for reclaiming fine iron ore dust which is present in the gas taken off from the top of the plant's two blast furnaces.

Cliffs Now a Century Old

Cleveland-Cliffs Iron Co. marked its 100th birthday early last week. It was in 1850 that the company's ore digging history began on the Marquette range near the present cities of Ishpeming and Negaunee, Mich.

Appropriately, after the monthly board of directors meeting the officers and directors sailed to Marquette to commemorate the completion of the company's first 100 years.

Dr. Harlan Hatcher, vice president of Ohio State University, Columbus, who wrote the book, *A Century of Iron and Men*, was speaker at the luncheon. His book reviews the history of the company and of the iron industry.

Cleveland Cliffs has extensive iron ore reserves in the Lake Superior region, primarily on the Marquette range. The company also owns substantial reserves of low-grade ore.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Bureau of Labor Statistics is tooling up for a change in its Consumers' Price Index. New model due in 1952. It should not invalidate labor agreements tied to it

LIKE all things American—automobiles, refrigerators, television—the Bureau of Labor Statistics' Consumers Price Index was eventually due for a model change.

Once known as the Cost of Living Index, it has been widely used by labor unions in bargaining for wage adjustments. It assumed particular importance when General Motors Corp. renewed its wage contract, based on the index, for five years.

Depression-Ridden—The index has been criticized chiefly because it was based on a study of consumer spending from 1934 to 1936. Those were depression-ridden days, and people weren't buying the same things then that they do now: They're now paying more for ownership and maintenance of their automobiles, for one thing.

They're buying less butter and more margarine. They're buying more alcoholic beverages—canned beer in the summer—and cigarets. Housewives' market baskets today contain many items bought sparingly or not at all in the 30s: Fresh fruit and vegetables, canned baby foods, prepared flour mixes, frozen foods. Families are buying new things that weren't on the market in the 30s: Television sets, deep freezers. The family rent picture shapes up a lot differently, too.

Labor Pains—One criticism of the index is that right now its rent component is not accurate, that it makes no provision for higher-than-average rentals charged on new homes built at high cost since the war.

Prodded by many economists, particularly those of labor organizations, BLS last year obtained a congressional appropriation to finance research on what changes should be made to bring the index in line with today's family spending.

Last November the bureau began a study to find out how city families of moderate income were spending their money. Just recently the bureau started a comprehensive program of collecting retail prices on about 110 food items now absent from the Consumers' Price Index. After all the data has been collected and studied, the bureau will get into the final phase—analyzing all the consumer expenditures and determining which of them and with what weights should be included in the index.

Birthday—The revised index should come into being July 1, 1952.

A BLS spokesman says: "The changes that may be made will not destroy the continuity of the index which goes back to before the first World War. They should not be regarded as invalidating any contracts under which wages or prices are adjusted according to movements of the index."

5-Year Weapons Program Seen

Because of rapid progress being made in the development of new military weapons—guided missiles, improved antitank equipment, radio-guided airplanes and anti-submarine devices and so on—Chairman W. Stuart Symington, National Security Resources Board, decided to change the character of the board's study of present and potential material and production resources in relation to military requirements programs.

Instead of relating such studies to a short-term picture, as heretofore, they now are to be related to forward military requirements. Something like a five-year weapons program is visualized.

Studies are being carried on to find the possibilities for applying some form of the phantom-order technique that was adopted last year on machine tools and accessory equipment to foundry equipment, presses, heat treating equipment and other capital goods items. The idea was to place the industries making such equipment in a better position for rapid mobilization. These studies are being related to the forward military requirements program.

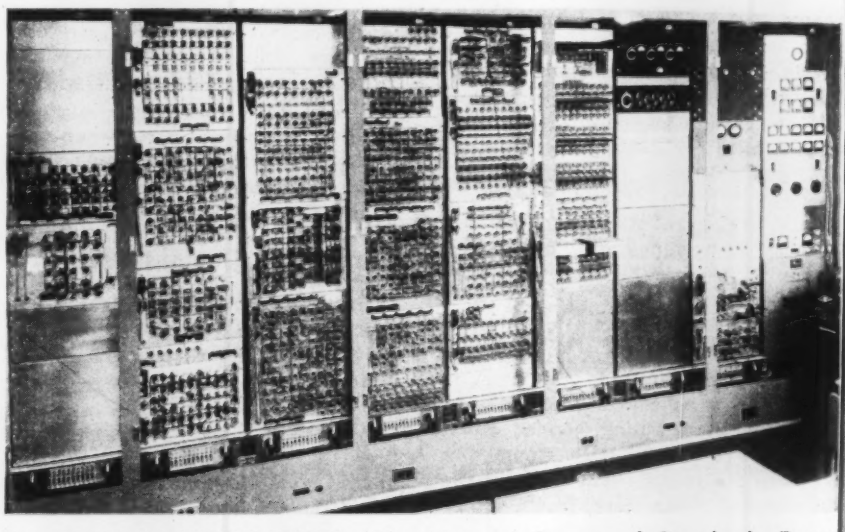
In Charge of Industry Advice

Now in charge of the Munitions Board's comprehensive industry advisory committee setup is Maj. Gen. Jerry V. Matejka. He succeeeds Maj. Gen. Alfred B. Quinton Jr. as acting director for production management. General Quinton has been reassigned to the office of Chief of Ordnance, U. S. Army.

General Matejka has completed an assignment as chief signal officer, European Command.

Arms Procurement Rule Revised

Present and potential military contractors will be interested in a general revision of the Armed Services Procurement Regulation bringing up to date sections that have been issued



BIG BRAIN IN WASHINGTON: The National Bureau of Standards Eastern Automatic Computer (SEAC), unveiled before key military leaders and government officials by Dr. E. U. Condon, director of the bureau, is a high speed general purpose automatic electronic computer. It is the first automatically sequenced, super-speed computer to be put into useful operation. It's the fastest computer in operation. It has already solved significant problems. It was designed and constructed in the record time of 20 months

so far. Published by the Department of Defense, the complete reprint and list of changes are bound together as one document. "Armed Services Procurement Regulation, Revision No. 1, June 1, 1950." Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, at 45 cents. The sections covered in the revised book are Sections I through VI, Part 1 of Section VII, and Sections IX, X, XI, XII, and XV.

Heiss Back in Ordnance

Brig. Gen. G. K. Heiss, known for his activities in ordnance, was reassigned to the office of Chief of Ordnance, Department of the Army. General Heiss for several years had served in the office of Secretary of the Army.

Titanium Application Works Out

Army Ordnance men are pleased with their first application of pure titanium to ordnance.

It's a base plate for the 81-millimeter mortar and consists of a round disk resting on fins that grip the ground when the mortar is fired. Disk and fins are made of titanium plate ⅛ to ⅜-inch thick; the fins are formed hollow by welding and are welded to the disk. The fins run radially from the center of the disk to the circumference. The disk is dished with the concave surface up and in its center is the pivot on which the mortar rests. The base plate was made at the Bureau of Mines Laboratory at College Park, Md., of titanium plate produced at the Bureau of Mines station at Boulder City, Nev. The entire project was undertaken to demonstrate the feasibility of using titanium for parts that must be tough and light in weight for airborne use and general portability. A mortar base plate of steel weighs 47 pounds; the titanium assembly weighs only 24 pounds.

The base plate met service tests satisfactorily and now ranks as a successful prototype that can be put into production at some future time—when and as titanium plate becomes available commercially and at acceptable prices.

More Storage Facilities

Farmers who want to purchase mechanical grain-drying equipment may now obtain Commodity Credit Corp. loans for this purpose through June 30, 1951; the previous limiting date had been June 30, 1950.

The period for obtaining loans on farm storage facilities recently was extended similarly. Both programs are part of the broad objective of the Department of Agriculture to develop more adequate storage facilities for farm commodities.

Are You Going To Vote?

"Have you registered?" "Are you going to vote?" These are questions you will hear often at appropriate times this year as a result of a businessmen's campaign directed from the nation's capital. Sparkplug is Rowland Jones Jr., president, American Retail Federation, Washington, who is enlisting the country's 1.8 million retail establishments in a get-out-the-vote drive.

"Failure of over 48 per cent of the qualified voters to vote in 1948 is an indictment of all of us," says Mr. Jones. His drive is non-partisan; he thinks business and the country can count on sound election results if the people actually get out and vote. "No true believer in our political institutions," he says, "need fear the future of our way of life when the election process is participated in by the great mass of our people."

To businessmen, Mr. Jones points out that in 1948 Ohio was carried by 6817 votes, Illinois by 33,612 and California by 32,512, and many other states by almost equally narrow majorities. The election result in Ohio would have been changed by a difference of 1 vote per precinct and in Illinois and California by a difference of 2 votes per precinct. The answer, says Mr. Jones, is: Get out the votes.

Missile Center Being Completed

First phase of a vast construction program at the Navy's Air Missile Test Center, Point Mugu, Calif., is nearing completion. Some $9.6 million in new facilities are either finished or under construction.

Facilities completed so far include a new telephone building, a new electrical distribution system providing three separate power sources over two separate routes, a new deep well of 2 million gallons daily capacity, a new gas distribution system, a reinforced concrete 21,000 square foot administration building, a new 20,000 square foot mess hall, a 110,000 square foot hangar and other works.

Other facilities under construction include a 60,000 square foot test and evaluation building, and a 40,000 square foot technical building. Contract for construction of a 25,000 square foot instrumentation building was awarded recently.

Congress two years ago authorized $30 million for permanent facilities at the Air Missile Test base and appropriated $14 million for initial construction and contract obligation during the fiscal years 1949, 1950. Second phase of the construction program, contingent upon appropriation of $16 million will include 34 separate projects, largely missile launching and other technical facilities.

Should the Townsend Plan Be Studied Again?

Social Security legislation passed by the two houses and now being compromised in conference is only another step toward the ultimate objective: Universal coverage, maximum benefits and a solid funding method for assuring continued safe operation of the system.

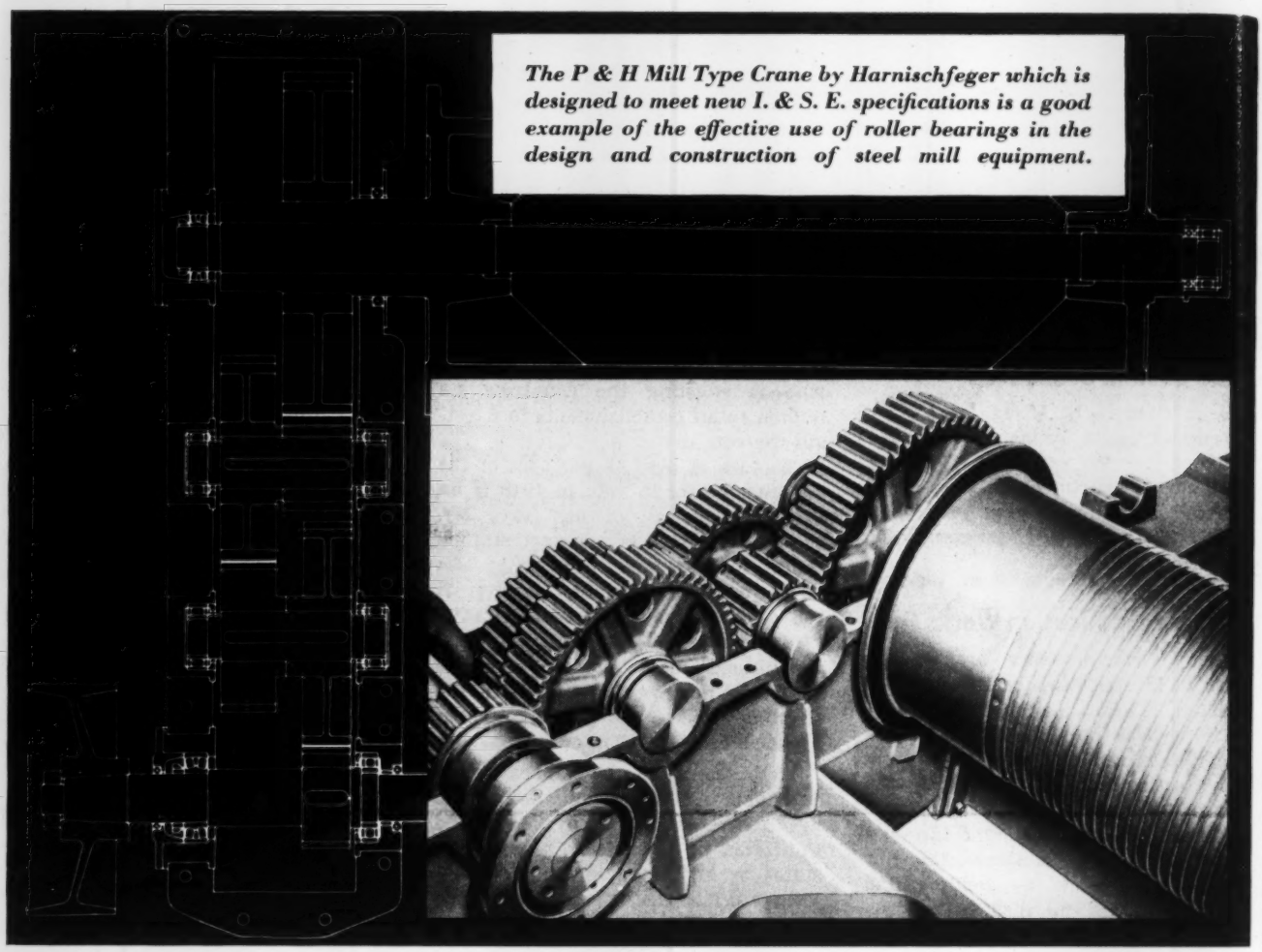
That's the goal of the congressional leadership, cited particularly by Majority Leader Scott Lucas (Dem., Ill.) who sponsored a resolution, immediately approved by the Senate, authorizing the Senate Finance Committee to organize a Social Security Study subcommittee.

Proper Relationship—How to treat industry's 13,000 private pension plans, all related to the federal social security system, is recognized as one of the biggest problems. "How to bring these into co-ordination, if that is possible, and how to establish the proper relationship between them are questions that will require a lot of study," says Sen. Eugene D. Milliken (Rep., Colo.), the Senate's expert on social security.

"We found much pressure for a new approach on the whole subject, as well as for a pay-as-you-go and universal-coverage system of some kind. We need more basic data on the administrative feasibility of wider coverage for agricultural workers, for instance.

"And we know that to sustain any kind of system we must keep the productivity of the country on the increase. Perhaps that could not be done if we prematurely retire people able and willing to work; we need to study plans for keeping elderly people working who are able and willing to work. We must give consideration to the many criticisms involving the reserve fund and the proposals to take the place of the reserve fund," says the senator.

Townsend Again—Sen. Walter F. George (Dem., Ga.) and Senator Milliken are agreed that the once widely derided Townsend Plan should again be studied because it called for a universal pension system, generous payments, current financing.



The P & H Mill Type Crane by Harnischfeger which is designed to meet new I. & S. E. specifications is a good example of the effective use of roller bearings in the design and construction of steel mill equipment.

More capacity···longer crane life

The Hyatt Hy-Load Bearings in the gear case illustrated are straight radial bearings offering maximum load-carrying capacity in the space available. No radial capacity is sacrificed to provide for thrust loads and the shafts carrying the spur gears can position themselves laterally with location being taken against the smooth ends of the shafts.

The bearings are mounted in cartridges to facilitate handling and simplify machining by permitting through boring. The two-part non-adjustable Hyatt bearings are easily and quickly installed and their extra load-carrying capacity results in longer, trouble-free life.

On the drum shaft a Hyatt straight radial bearing is used at one end and a spherical bearing at the other. This provides ample provision for thrust loads, which occur when hoist cables unwind at an angle, and permits shaft expansion through the radial bearing with all danger of floating a bearing in the housing bore eliminated.

• • •

Your nearest Hyatt field office will provide the kind of bearing information that encourages effective design and construction. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Pittsburgh, Detroit, and Oakland, Calif.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Auto makers are expanding and modernizing to cut costs, not to expand capacity much. Studebaker, Chrysler and Oldsmobile have programs in the works

DETROIT

AUTO makers continue to lay it on the line for expansion and modernization of plants and equipment, which may appear strange because the industry right now can bat out 200,000 cars and trucks a week, equivalent to an annual pace of 10 million vehicles. The explanation of continuing capital investment is tied more closely to cost reduction, of course, than to a mere lifting of productive capacity.

For the Eastern Market — Thus, Studebaker's proposal to spend $5.5 million for immediate construction of a passenger car assembly plant at New Brunswick, N. J., with capacity for 85,000 cars a year, will permit handsome savings in the cost of delivering cars to eastern buyers. Engines, stampings and other components produced at South Bend, Ind., will be shipped by rail and truck to the New Jersey site for assembly, painting and trimming. The building, on the main line of the Pennsylvania Railroad, will be a one-story structure with better than 400,000 square feet of floor space, requiring a working force of 2500 when operations are started next March.

The new facilities will place an extra load on manufacturing departments at South Bend, although there could logically be expected some easing off in final assembly work there. Currently the company is building about 1300 passenger cars a day, and the indicated rate for the eastern assembly plant figures to around 350 daily. If the retail market holds to anything like its present strength, more help will be needed to staff manfacturing operations in South Bend. Studebaker also assembles cars in plants at Los Angeles and Hamilton, Ont.

More Research?—Recent appointments to three key positions in the research department of the company's engineering division suggest the emphasis being given certain phases of oncoming engineering development, particularly automatic transmissions and new high-compression power plants. M. P. deBlumenthal, who has been supervising automatic transmission development, has been named assistant chief research engineer. T. A. Scherer, veteran engineer, has been elevated to chief power plant engineer and will be a No. 1 figure in the company's active new engine project.

T. E. Wagar, with the South Bend manufacturer for more than 40 years, now becomes chief electrical engineer and will continue to direct all phases of electrical development.

Machine Tools for Olds Engines—Over 100 new machine tools, plus a variety of other types of equipment, will be purchased by Oldsmobile in a multimillion dollar program to increase productive capacity for its V-8 high-compression engine. Production of the present 6-cylinder L-head engine will be discontinued entirely this fall and the valve-in-head job installed in all models. Equipment and space in the 6-cylinder engine plant which adjoins the elaborate V-8 engine department will be utilized to meet the expanded needs for V-8s. However, limited production of parts and service engines for cars now on the road will be maintained.

Courtesy Automobile Facts

NO MUSICAL STRAINS: One method of testing modern automotive parts is by this electronic tuning fork used to check reverse bending fatigue. Two heavy steel bars (in the center of the photo) form the prongs of this outsized fork. A section of crankshaft is fastened firmly between them. Strain is induced in the part by vibrating the fork. The fork soon finds out what auto parts will strike "sour notes"

It is not entirely clear what the move will mean as far as the 76 and 88 series of cars are concerned, since the main difference between them now is the engine, both using the "A" line of General Motors bodies. Evidently the 76 will pass into the discard for 1951, permitting the company to concentrate principally on the 88, with a small portion of capacity given over to the larger 98 series.

Olds Makes News—During the second ten days of June, Olds dealers sold 11,437 cars, an increase of 46 per cent over the same period a year ago and bringing deliveries from Jan. 1 to June 20 up to 182,395, or 50 per cent ahead of last year. Production is holding at an all-time peak, approximately 8600 each five days.

Suspension of operations over the Fourth of July holiday, scheduled by all GM divisions, will trim this week's figure by about 40 per cent, but next week should see a rebound to the higher total. Sales reports for the first ten days of July will be watched carefully as the tipoff on summer market conditions.

Chrysler on the Wing—Not yet announced officially but understood to be in the engineering stage is a new wing for Chrysler Corp.'s Nine-Mile press plant. This enormous stamping plant, which came into production only within the past year, seems already to have outgrown its equipment.

Chrysler directors at their June 22 meeting declared a $1.75 per share dividend but took no action on a stock split which had been rumored around Detroit for several weeks.

Stop-and-Go Operations — Passenger car building divisions of Chrysler have been experiencing some difficulty in maintaining their high rate of operations because of interruptions in parts supplies from a number of sources arising out of labor troubles. A one-week strike at Motor Products Co. shut off the flow of window moldings, while Briggs Mfg. Co. came within an ace of being closed because of new contract wrangles. Agreement finally came in time, with the UAW-CIO being granted pensions following pretty much the industry

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pattern, plus a wage increase of 5 cents an hour and some other benefits.

The agreement was for three years and can be opened each year for discussion of economic issues only.

Briggs' Sales Rise in 1949

Briggs' sales last year topped $338 million, yielding net income of 3.9 per cent or $6.88 per share of common stock. Last year was the company's fortieth and by every measurement the greatest recorded. Employment rose to 35,495, up 6000 from 1948 and comparing with 21,158 back in 1941. Factory payrolls soared to $103 million despite loss of 7,047,858 man-hours because of work stoppages and absenteeism both at Briggs plants and outside parts sources. Absenteeism alone accounted for better than 5 million lost hours.

During the year, Briggs chewed up 452,000 tons of steel to make bodies, body parts and plumbing fixtures, representing a gain of 80,000 tons over 1948. Costs and services purchased from 3717 suppliers totaled well over $200 million. Plumbing ware production, measured in terms of the weight of enameling sheets consumed dropped 22 per cent from 1948 to 1949, although estimates indicate the trend will be reversed this year. Steel consumption for this division last year was about 15,000 tons.

Chevvy Transmissions Roll

Production of 100,000 automatic transmissions in six months is a considerable achievement and Chevrolet recently took time out to signalize the accomplishment, at the same time announcing that daily assemblies at the company's Cleveland plant will be stepped up from 1300 to 2000. This will involve more equipment at Cleveland but little change at the Flint, Mich., pressed steel department which can step up output to 2000 per day with little difficulty.

The transmission has 607 precision parts in all.

Kaiser-Reo Tieup?

Last week's announcement of a working agreement between Kaiser-Frazer and Reo plant near Toronto touched off conjecture here over whether this might be the forerunner of a possible tieup between K-F and Reo in the U. S. to give the 3000-odd K-F dealers in this country a line of trucks to merchandise.

Reo is building about 175 trucks a week at the present time, might do far better than that with more aggressive and extensive sales effort such as K-F dealers might be able to provide. Trucks carry a good profit margin and tie in nicely with a line of passenger cars, as is the case with Chevrolet, Ford, Dodge and Studebaker.

Reo has a substantial volume of Army orders for trucks and recently introduced an entirely new design of truck engine with good operating characteristics.

Large investment in new machine tool equipment was made to outfit the Lansing plant for production of this engine.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	732,161	508,101
Five months	3,044,019	2,510,366
June		523,689
July		604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
June 10	200,515	139,540
June 17	204,704	146,056
June 24	205,820	153,001
July 1	195,000	144,822

Estimates by Ward's Automotive Reports

* Preliminary.

Truck Demand Holds

Sustained demand for trucks is one of the most surprising features of the automotive market fooling many seasoned observers who were looking for truck sales to hit the skids early this year.

Latest official figures show truck production for five months of this year was 560,340 or 4350 above the total for the same months last year. May was the high month for this year.

Assemblies that month ran to 131,542. Bulk of this volume—56,718—was in the 5000-pound and under gross vehicle weight. However, even in the heaviest classification—26,000 pounds and over—there has been a steady increase since the first of the year with May showing 2520 units, compared with 1561 in January. Declines were registered in production of medium truck classifications compared with last year.

Canadian Output Rises

Another striking statistical note is the sharp rise in Canadian passenger car assemblies this year. In five months of this year, they have totaled 109,795, against only 68,823 last year.

That is a gain of approximately 60 per cent and is not matched by Canadian truck assemblies which are slightly below last year.

U. S. Exports Low

Factory sales of all motor vehicles in the U. S. for May totaled more than all the cars and trucks in Mexico and Brazil combined, the Automobile Manufacturers Association observes, and the outpouring would supply every family in St. Louis and Minneapolis with a new car. U. S. exports, however, continue at low level.

Shipments abroad in the first five months of the year were 101,767 units, compared with 140,185 in the same period a year ago. No early prospects are seen of any substantial improvement in automotive exports, although a Willys-Overland official recently returned from Latin America voiced optimism over firming business in those countries.

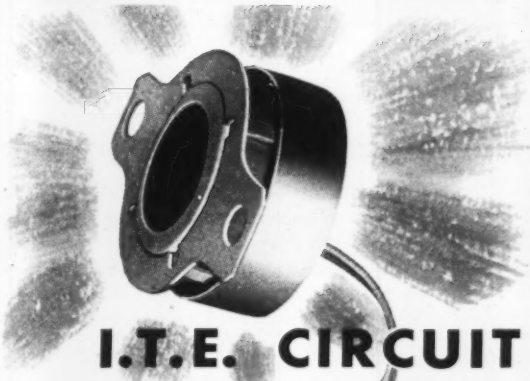
Fly Customers to Plant

Hudson dealers on the West Coast have instituted an unusual sales technique in offering to fly a new-car buyer and one companion to Detroit by chartered plane, furnish room and board for one day at a swank hotel while the purchaser picks his car up at the factory, and pay $41 a head in cash to cover cost of the return motor trip to California. The dealers lose nothing, since the freight cost of shipping cars from Detroit to the West coast (about $280) more than makes up the outlay involved in handling trips for the buyers, providing 25 can be assembled at one time to fill the chartered airplane.

The only apparent losers are the railroads.

More Miles in Transmission Oil

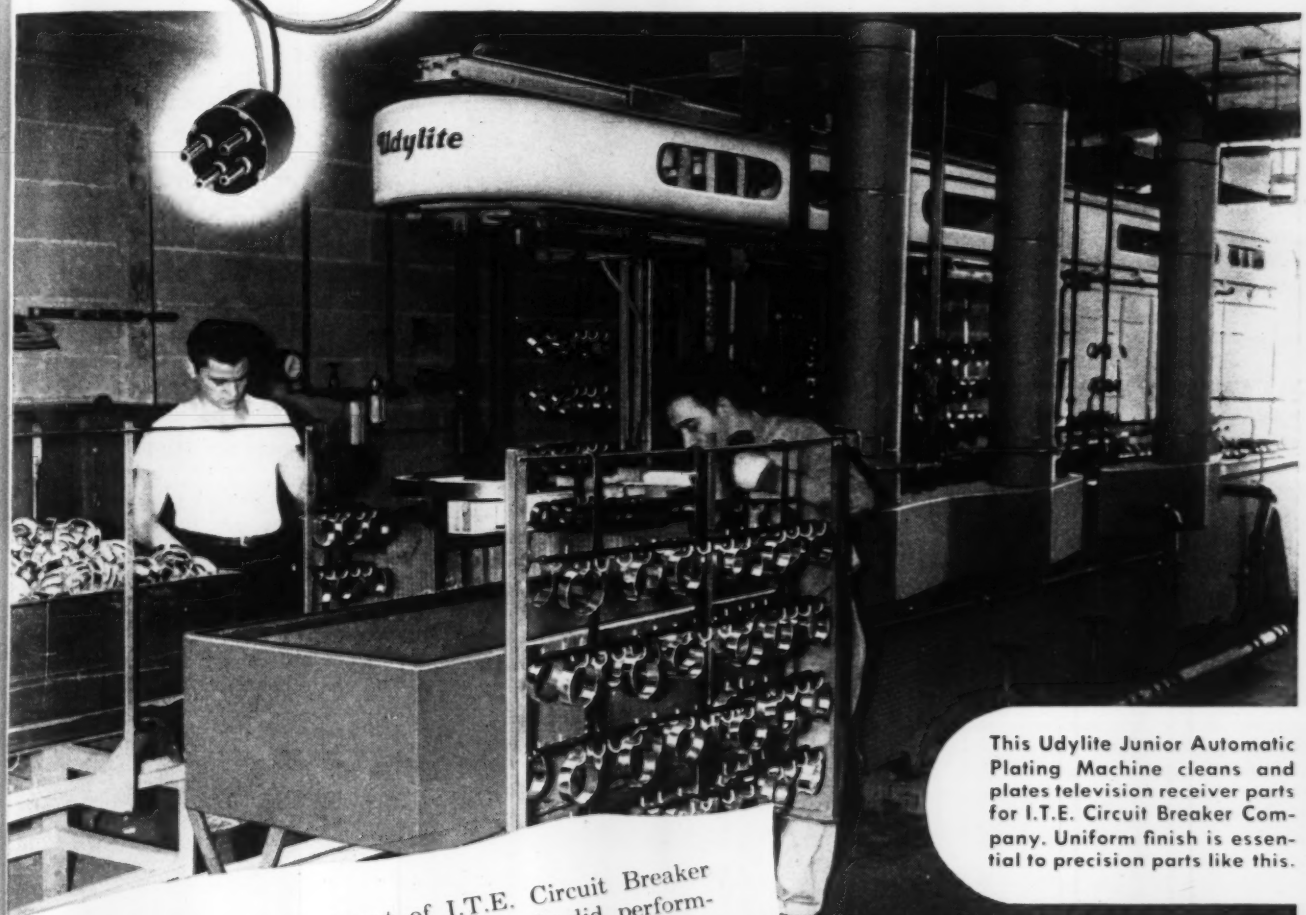
The petroleum industry has developed special transmission oil additives, including pour-point depressors for low-temperature operation, antifoam agents, antioxidants and viscosity index improvers. At one time it was necessary to change oil in the transmission every 10,000 miles; this has been lengthened to 15,000 miles



Udylite JUNIOR AUTOMATIC

gives increased production... more uniform plating for

I.T.E. CIRCUIT BREAKER COMPANY



This Udylite Junior Automatic Plating Machine cleans and plates television receiver parts for I.T.E. Circuit Breaker Company. Uniform finish is essential to precision parts like this.

THE plating department of I.T.E. Circuit Breaker Company, Philadelphia, reports splendid performance by their Udylite Junior Automatic plating machine. Used primarily for finishing television receiver components—this Udylite unit incorporates BOTH cleaning and plating in ONE operation. The results are: greater quantity and improved quality of production with lower direct labor costs.

This is typical of the results gained by Udylite customers. In virtually every case they report that Udylite plating equipment and processes give them both cost reduction and increased quality of plating. You can reap these same rewards with Udylite. Call in your Udylite Technical Man and let him analyze your operation and make recommendations for bigger plating profits for you. Or write direct to the Udylite Corporation, Detroit 11, Michigan. There's no obligation.

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Railroads Robbing Peter To Pay Paul

A Senate subcommittee is poring over the whole railroad situation to see if either "Peter" or "Paul" will be able to stand the strain in case there's a war

THE RAILROADS are robbing Peter to pay Paul, and Peter is feeling the pinch. A Senate committee is studying the matter to see if either of them can stand the strain in case of war.

Rail freight rates have risen 61 per cent since before the war, partly to subsidize passenger service losses. But that 61 per cent freight hike has contributed to a loss in freight volume. Freight car loadings of 8.1 million cars in the first 1950 quarter fell 8 per cent from the 9.0 million loadings in the first period of 1949 and 15.7 per cent from the 9.8 million loadings in the first quarter of 1948.

Not Flying High — Railroads have lost over $2.5 billion on passenger service since the war. The carriers dropped $559 million in 1948, $649 million in 1949 and will probably lose $700 million on passengers this year.

Potential rail passengers are using their own cars and the airlines more. Private autos carried 82 per cent of intercity travelers in 1948; the trend is up. Intercity busses, surprisingly, are also losing ground.

Troubles in Transportation—Sen. Francis J. Myers (Dem., Pa.) heads a subcommittee of the Senate Interstate & Foreign Commerce Committee to study the whole transportation situation, but particularly railroads. What the group is trying to find out is this:

1. What can be done to maintain railroads' passenger-carrying potential despite present financial losses? A large capacity is needed to transport swollen passenger loads and troops in case of war.

2. Will there be enough freight cars in case of a national emergency? Old cars are being retired much faster than new ones are being built.

3. Are enough freight car orders being placed to maintain our car-building potential safely? We have a capacity to build 160,000 new cars a year. Nothing near this total is being built.

4. What can be done about the low return on railroads' property investment? The 3.3 per cent average return in recent years is inadequate for essential modernization.

What's Coming?—What the committee will recommend in its final report scheduled for late this year is not known, but support is growing in Washington for more government control of all domestic land and water transportation. Witnesses at the subcommittee's hearings point to cases of duplicating rail, bus and water services, all operating at a loss.

SENATOR MYERS
. . . "working on the railroads"

E. R. Jelsma, staff director for the subcommittee, told STEEL: "It is in the national interest to solve these problems. The land and water transportation segment of our economy now accounts for 7.5 per cent of our national income."

Dravo Launches Barge for Army

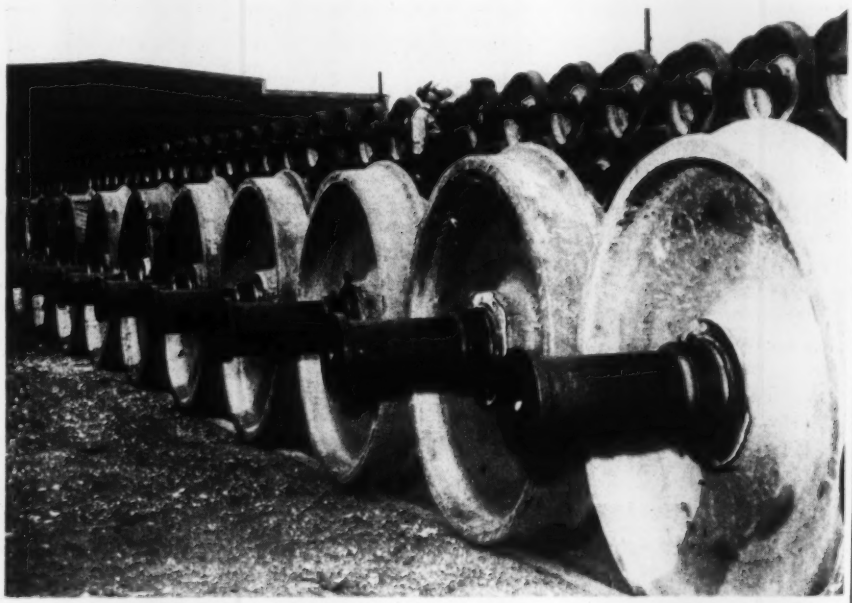
First in a 12-barge fleet to be used by the Transportation Corps, U. S. Army, for moving aviation fuel on the Mississippi was launched by Dravo Corp., Pittsburgh. Each welded steel barge is 235 feet long, 40 feet wide and 11 feet 9 inches deep. At a draft of a little more than 8 feet each vessel carries 13,000 barrels of gasoline.

Diesel-powered cargo pumps are used to discharge either gasoline or kerosene at shore installations. Machinery is located in a deckhouse on the afterpeak with the diesel engine geared to drive a vertical pump in the after rake hold.

Car-Type Furnace for Grinnell

Rust Furnace Co., Pittsburgh, designed and will build a car-type annealing furnace for Grinnell Corp. at Warren, O. The furnace is expected to be used before this fall.

It is designed for temperatures up to 2000° F. Interior dimensions are of 15 feet by 40 feet 5 inches with a usable height of 10 feet. Either natural gas or oil will be used for heating. Three-zone automatic temperature control and automatic pressure control will be included.



SOON TO ROLL: These are a small portion of the thousands of railroad car wheels that will soon be turning for American industry. They are part of Union Pacific's $23 million freight car building and purchase program. Photo was taken at UP's Omaha shops which, with shops at Denver and Grand Island, Nebr., are turning out 2500 box cars and 500 stock cars. A thousand gondola cars are being purchased from General American Transportation Corp., Chicago

New Ideas in Testing

They're bound to come forth as result of annual meeting of 2100 engineers and scientists

DON'T BE SURPRISED if you hear of many new ideas in the field of materials testing this year.

Twenty-one hundred leading engineers and scientists have had their heads together on this subject, so something new is bound to result.

Convening at Atlantic City, N. J., last week at the annual meeting of the American Society for Testing Materials, they held 450 committee meetings and 23 technical sessions.

Committees approved 68 new tentative specifications. In addition, specifications on malleable iron fittings, flanges and valve parts were continued tentatively for one year.

$64 Dollar Questions—During the technical sessions many problems were presented for possible solution and many suggestions made in connection with testing procedures that have been stumping the experts. For example, men like C. T. Evans Jr. of Elliott Co. asked, "What can be done to overcome coal and oil ash corrosion of metals at high temperatures?" The answer to this question stands to accelerate development of gas turbine power plants.

In making stress rupture tests, O. Cutler Shepard, professor of metallurgy, Stanford University, suggested that these should be made in the environment for which the material being tested is intended. He said air often is a detriment rather than an asset as it provides a sort of protective coating which may affect the whole test.

Easy Does It—By borrowing a testing procedure used by the paper industry, the strength of annealed aluminum foil now can be tested without resorting to sample efficiency measures. Previously, said F. M. Howell of Aluminum Co. of America research laboratory, the sample had to be ½-in. wide and cut off with perfectly straight edges. Now with the Mullen bursting technique the sample is just torn out and burst.

Twelve members were honored during the week. B. J. Lazan, professor of materials engineering, Syracuse University, was awarded the Charles B. Dudley Medal.

The Richard L. Tentlin award was made to D. S. Clark and D. S. Wood, both of California Institute of Technology.

The Sam Tour award went to O. B. Ellis, senior research engineer, research laboratories, Armco Steel Corp.

For a Job Well Done—The following received certificate awards of merit for outstanding technical work in various committees of the society: Alfred P. S. Bellis, retired, formerly with John A. Roebling's Sons Co., Trenton, N. J.; Allan W. Dow, consulting engineer, New York; Daniel W. Kessler, National Bureau of Standards; T. Smith Taylor, U. S. Testing Co., Hoboken, N. J.; LeRoy L. Wyman, Knolls Atomic Power Laboratories, General Electric Co.; Harold F. Dodge, Bell Telephone Laboratories, New York; Howard P. Ferguson, Standard Oil Co. of Ohio, Cleveland; Thomas G. Stitt, Pittsburgh Steel Co., Pittsburgh; Percy H. Walker, the Bureau of Standards.

New president of ASTM is L. J. Markwardt, assistant director, U. S. Forest Products Laboratory, Madison, Wis., and new vice president is Truman S. Fuller, engineer in charge of works laboratory, General Electric Co., Schenectady, N. Y.

Horatio Alger Story: Youngstown Alloy Casting Corp.

YOUNGSTOWN'S smallest steel plant is busting out of its britches again because of the steel boom. That steelmaker, Youngstown Alloy Casting Corp., is planning a new addition to its brand new plant even before it is fully settled in the plant that was to have solved its expansion problems for years to come.

Nestled almost in the shadows of some of the Mahoning Valley's really big steel mills, Youngstown Alloy makes its living serving the big steel mills. It makes a wide variety of special steel castings: Bar mill guide shoes, tube mill plugs and guides and other steel castings for Republic, Carnegie-Illinois, Sharon, Jones & Laughlin, Inland and many others.

Alias Jack Trantin—Youngstown Alloy is housed in a plant that is regarded as a model steel foundry. It occupies a 5½-acre site, has a steel building 90 x 150 feet, a 32 x 70-foot pattern storage shop and a brick office building. Among the equipment of the plant is: A small electric furnace, a row of centrifugal casting machines, a product on conveyor system and a Dispatch gas-fired recirculating core oven.

Youngstown Alloy Casting is really Jack Trantin, a metallurgical engineer, and it got started as a tiny open-hearth furnace in the back yard of Trantin's home. It was built of junk and brick resurrected from a slag dump near Niles, O. Trantin was visiting a bar mill when he got the idea for his plant. The bar mill was down while the guide shoes were being changed. He found out that they never did last very long—two or three hours, four at the most. The mill superintendent told him that the worn guides would injure the quality of the steel being rolled, too. So Trantin decided he'd make good alloy steel guides. He did. To the astonishment of himself and workers on a mill that tested the guides, the set he made lasted for weeks.

Old Bricks, Crankcase Drainings—Because he couldn't raise any money (it was right in the midst of the depression), he started out by building his plant with the old bricks and no money. He borrowed an auto trailer and gathered up crankcase drainings which he used for fuel. When the bar mill guides he made caught on, he developed a new steel, Trantinyl, which wore even better than his first attempt at alloy guides. And he took on other products—guides for shaping and tube mills, forging rolls and others.

JACK TRANTIN
. . . good guide for bar mills

Eventually he moved to Youngstown and operated there for years until he built his new plant. He attributes a good deal of his success to his incentive pay plan. Because he needed more output to fill his orders and couldn't find the men or the room, he decided to let his employees share the profits. His bonus system succeeded in doubling the output its first month without an increase in manpower. Since early in the war the production for Youngstown Alloy Casting and/or Jack Trantin has been boosted six times without extra manpower.

Private Capital Story

California industrial developers are offering a hybrid type of "home owning" plan

PRIVATE capital is behind a project in Los Angeles to help small manufacturers that have less than 50 employees.

Industrial developers in California, finding that over 90 per cent of their prospects are small firms, are offering "home owning" plans that are a cross between the common leasing arrangements for industry and mortgage loan programs for private homes.

Own Your Own—One company, developer of the "Los Angeles International Airport Industrial Tract," is offering buildings designed to the customers' needs which can be paid for on a monthly rental basis of 4½ cents per square foot or less. An initial down payment is required that is applied on a final period of the contract, at which time the property is deeded to the purchaser.

The developer says it can do this because it has: A large tract of land, a mass building program, high volume sales and multimillion dollar capital to grant the long-term credit often denied the small manufacturer by present financial sources.

Frigidaire Gets Another

General Motors' Frigidaire Division announced a $12 million plant expansion at Moraine City, O., a suburb of Dayton.

The division will build a new $9 million factory covering 22 acres and a $3 million, 11-acre addition to its warehouse, M. M. Roberts, GM vice president and Frigidaire general manager said.

Brown Instruments Expands Line

More than a dozen new instruments constitute the line that Brown Instruments Division, Minneapolis-Honeywell Instrument Co., Philadelphia, is introducing to expand its activities in the central power station instrumentation field. Included are instruments and pyrometer accessories for steam plants and electric distribution. A nationwide promotion will follow private showings.

Allianceware 'Cleaning Up'

Allianceware Inc., Alliance, O., is planning further expansion of manufacturing facilities to meet the demand from the booming homebuilding industry and the use of steel bathtubs.

The company, which makes steel-porcelain enameled bathtubs, washing machine tubs, sinks and lavatories, has construction drawings completed and land acquired for a plant at Colton, Calif. Construction is expected to start within the next few weeks and operations in the plant are planned for late this year.

Harvester Building Laboratory

Preliminary site preparation work was started on a new $6.5 million motor truck engineering and laboratory building for International Harvester Co. at Ft. Wayne, Ind. The structure will be located on a 25-acre tract of land; it will have a 1000-foot frontage directly opposite the east entrance of the company's existing motor truck plant.

Kelite Patents Coating Process

Kelite Products Inc., Los Angeles, patented its new Poly-Kote, a non-inflammable and non-toxic treatment for iron and steel preparatory to painting. The coating applied by dipping or spraying eliminates the need for chromic acid treatment, and can be controlled to provide a light or heavy paint-bonding film. The firm claims salt spray tests show superior corrosion resistance for painted and unpainted surfaces.

Laclede Gas Selling Coke Ovens

Robert W. Otto, president of Laclede Gas Co., St. Louis, says his firm is selling its by-products coke plant to Great Lakes Carbon Corp., New York, on a basic bid of $700,000.

The Laclede plant includes 64 coke ovens and other equipment used in the manufacture of coke and gas and the extraction of various by-products such as light oils, ammonium sulphate and tar.

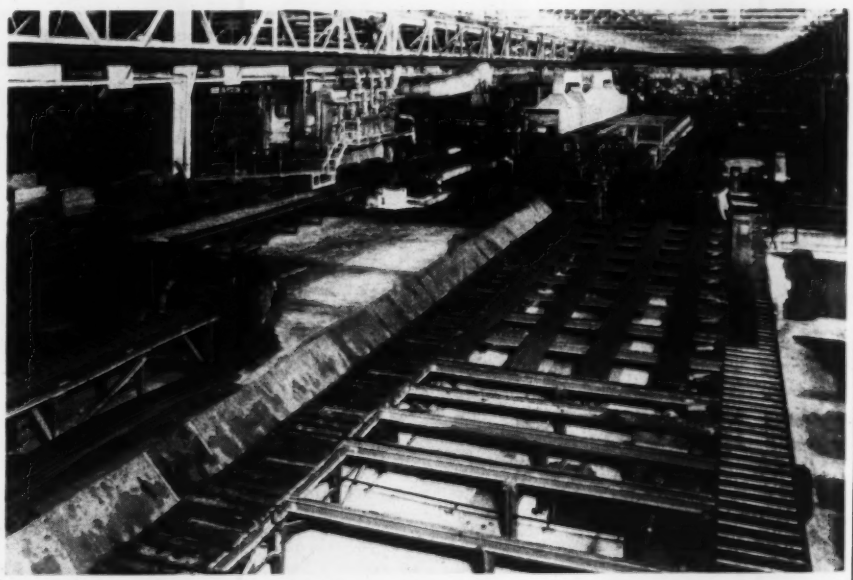
Steber Adds Industrial Lights

Steber Mfg. Co., Broadview, Ill., bought Detroit Industrial Product Co.'s tools, dies and manufacturing rights covering Heavy Duty machine and bench lights, formerly marketed by the Detroit company.

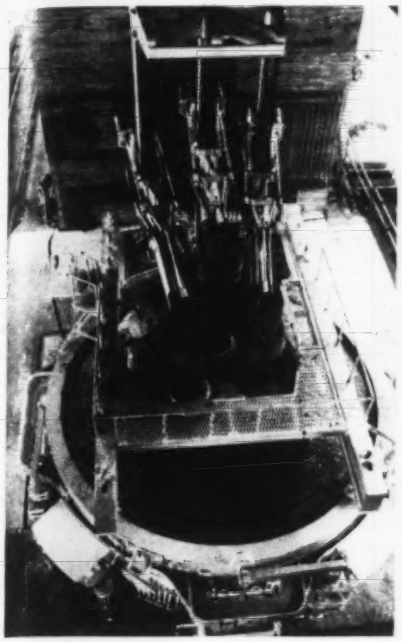
The entire line is being marketed through distributors under the name "Sturdiflex." It includes types for all applications of localized lighting requiring a fixture which can be instantly adjusted to any desired position without tools.

GE Finishes Repair Depot

General Electric finished construction of new and expanded repair,



MORE BRASS: A major step in American Brass Co.'s program to satisfy exacting customer requirements is this new Buffalo sheet and strip mill. It can cast brass cakes in a variety of widths, 6 inches thick and 72 inches long. The furnace at the left discharges a heated cake onto the conveyor which carries it to the reversing mill for preliminary reduction. Carried on the conveyors, the bar is spray cooled, flattened, milled, further reduced and coiled in a continuous operation. Heavy coils then receive process reductions on 4-high mills. They may be finish rolled on any of several types of mills including a Sendzimir mill that operates as high as 1000 feet per minute. Other new equipment includes three annealing furnaces, a continuous annealing and pickling unit and four special slitters



CARBON COPIES: Installation of three 20-inch electrodes marks the completion of Bethlehem Pacific's new 75-ton electric steelmaking furnace at its Los Angeles plant. Largest of its type in the West, the furnace augments production of a 50-ton model installed two years ago. The furnace, a three-phase arc type of the top charge design, has a shell of 1⅛ inch steel plates and measures 20 feet in diameter

maintenance and warehousing facilities for service to users of GE apparatus in the Rocky mountain area at Salt Lake City, Utah. The facilities will be used to service equipment for mines, smelters, power companies and industrial concerns. GE now has 30 such installations.

Porcelain Metal Products Sold

Porcelain Metal Products Co., Pittsburgh, steel fabricator and manufacturer of metal signs, was sold to a group of Ohio and Pennsylvania businessmen. Selling price was not disclosed by former president Jacob U. Meyer, who no longer is associated with the company.

Allis Seal Corp. Formed

E. H. Ball, president of Chicago Belting Co., Chicago, announces the formation of Allis Seal Corp., a wholly owned subsidiary of Chicago Belting. Allis makes fluid, grease and dust seals.

How Go Manufacturing Trends?

How America's manufacturing trends will go for the next three to five years is expected as an outgrowth of Lehigh University's second Product Design Seminar held at Bethlehem, Pa., beginning last week and ending July 26. It is being presented jointly by the Society of Industrial Designers and Lehigh University.

Happy Birthday, R. Dudgeon

Still going strong after a century, Richard Dudgeon Inc., manufacturer of hydraulic machinery, is moving from New York city to Brooklyn.

Besides being proud of its first 100 years, Dudgeon can boast that its founder, Richard Dudgeon, Scottish inventor and engineer, built a steam wagon in 1853. The vehicle got up to 14 miles per hour over ordinary roads with ten passengers. At top speed it could reach 20 miles per hour. It was destroyed in the Crystal Palace fire in New York where it had been placed on exhibition in 1857. Dudgeon's second carriage, built in 1866, exists today and can still be operated.

Among the hydraulic jacks that Dudgeon made were those designed to raise the Obelisk brought to New York from Egypt, jacks for construction of the Brooklyn bridge, for laying the Atlantic cable, for raising the steamship Great Eastern out of the mud and the battleship Maine from the bottom of Havana harbor.

The history-making concern built forcers and boiler test pumps for the Navy during the war. It makes hydraulic jacks from ten to 10,000 pounds.

Parker Gets Malleable Award

Presentation of the 1950 McCrea Medal, awarded annually for outstanding service to the malleable castings industry, was made to Frank O. Parker, vice president, Dayton Malleable Iron Co., Dayton, O., at the Malleable Founders' Society's annual meeting in Hot Springs, Va. Mr. Parker launched his career in the malleable industry when he became an inspector for the Malleable Founders' Society in 1923. He was specially cited for his contribution as chairman of the committee that produced the society's motion picture entitled "This Moving World" which tells how malleable iron is made, tested and used.

Ralph T. Rycroft, vice president of Kencroft Malleable Co. Inc., Buffalo, will serve as president of the society for the coming year. Cal C. Chambers, president of Texas Foundries Inc., Lufkin, Tex., is vice president. Lowell D. Ryan is renamed managing director and secretary by the society's board of directors and James H. Lansing enters his 15th year as technical and research director.

Armco Invites All Middletown

Everybody in Middletown, O., is being invited to help Armco Steel Corp. celebrate its 50th anniversary on July 12. Charles R. Hook, Armco's chairman, says that since both Armco and Middletown have worked and grown together it is only fitting they should celebrate together.

It was 50 years ago on July 12 that the cornerstone was laid for the company's original building. On that day schools and stores were closed and the whole town turned out to welcome the new industry the late George M. Verity was founding. To make the coming celebration a success, a committee of 1000 Armco people is being appointed. Since general plans call for food, refreshment and entertainment for all attending, there will be plenty of work for all those on the large committee.

THE BIG STRETCH: That's Lockheed's nickname for its new 200-ton hydraulically operated Hufford stretch press, one of a group of new machines being installed at the company's Burbank, Calif., plant where a $5 million-set-for-jets expansion program is going on. Looking over a piece of 75ST aluminum alloy than was stretched on the Hufford are: G. A. Fitzpatrick, works manager; Courtland S. Gross, vice president and general manager; and B. C. Monesmith, manufacturing manager. Lockheed is building its factory around such giants as the Hufford at Burbank

Men of Industry

GUY S. PEPPIATT
. . . new president, Federal-Mogul

S. E. McCRUM
. . . sales promotion mgr., Feedrail Corp.

ALLEN P. BECKLOFF
. . . Ryerson manager, tubular products div.

Guy S. Peppiatt, executive vice president, **Federal-Mogul Corp.,** Detroit, was elected president to succeed **H. Gray Muzzy,** who becomes chairman of the board.

George Carleton Jr. was elected president, **Nice Ball Bearing Co.,** Philadelphia, to succeed **Walter H. Rossmassler,** retired. Mr. Carleton, who has been with the company since 1929, was previously executive vice president.

W. E. Henges, Cleveland district manager, **Graybar Electric Co.,** New York, will become assistant to the president Sept. 1. **C. E. Kirkpatrick,** manager of the Memphis, Tenn., branch, will succeed Mr. Henges at Cleveland. **J. W. Horne** becomes manager of the Memphis branch, and **W. McNulty,** manager of the Syracuse, N. Y., branch.

Don C. Stablein was appointed general sales manager, **K. O. Lee Co.,** Aberdeen, S. Dak. He succeeds **Don T. Lyons,** recently assigned to duties as general sales manager, Bishman Mfg. Co., Osseo, Minn.

Kennametal Inc., Pittsburgh, elected as new members of the board of directors: **George T. Kearns,** treasurer, and **George G. Schuster,** for many years manager, statistical department, Kidder, Peabody & Co., New York.

J. V. Naish was elected vice president- contracts for **Consolidated Vultee Aircraft Corp.,** San Diego, Calif. **Emmett A. McCabe,** former director of public relations, becomes manager of advertising.

S. E. McCrum was appointed sales promotion manager, **Feedrail Corp.,** New York, subsidiary, Russell & Stoll Co. Inc. He previously was advertising manager, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp.

C. S. Davis Jr. was elected president, Norge Heat Division, **Borg-Warner Corp.,** with central offices in Detroit. He formerly was vice president and general manager of Norge Heat. Previously the chief executive of the division was **G. P. F. Smith,** who relinquishes this post to devote full time as president of the Norge Division. Mr. Davis has been general manager of Norge Heat since it was founded as a separate division of Borg-Warner in 1946.

Capt. Howard T. Orville, Navy aerologist and one of the nation's foremost weather authorities, is retiring after 29 years' service to become director of engineering for **Friez Instrument Division,** Bendix Aviation Corp., Baltimore, producer of scientific weather recording equipment.

Charles L. Haslup was appointed sales manager, R-P & C Valve Division, **American Chain & Cable Co. Inc.,** Bridgeport, Conn. He will make his headquarters in Reading, Pa.

P. J. Ganley, formerly general sales manager, Leland Electric Co., has joined **A. O. Smith Corp.,** Milwaukee, in its electric motor division.

E. T. Warren was elected president of **Tata Inc.,** New York. He has held the position of vice president since his return from India in 1949.

Allen P. Beckloff was appointed manager, tubular products division, **Joseph T. Ryerson & Son Inc.,** Chicago. He was manager of the tubular products department of the Ryerson plant in Cleveland and succeeds **R. W. Burt,** recently appointed Chicago plant sales manager of the company.

Kenneth Bassett was appointed supervisor of sales promotion, **Dodge Mfg. Corp.,** Mishawaka, Ind. He has been associated with Dodge for 23 years.

Dearborn Chemical Co., Chicago, appointed **J. F. Lingeman** as manager of purchases and production. He was appointed assistant to the vice president in February of this year.

Wheelock, Lovejoy & Co. Inc., Cambridge, Mass., appointed **Edward S. Waltz** Detroit district manager to succeed **C. Robert Jenks,** retired.

Ferro Machine & Foundry Inc., Cleveland, promoted **Ernest M. Knapp** from treasurer to president, and **Rex J. Myers** from assistant foundry superintendent to vice president in charge of operations. **Donald L. Heine,** chief accountant and comptroller of the company, was elected treasurer and assistant secretary. **John M. Price,** president, becomes chairman of the board of directors, which position was held for over 30 years by the late **Crispin Oglebay** in the predecessor company. **Henry B. Myers,** who started with the company 38 years ago and has been vice president in charge of operations for 20 years, will retain his title of vice president and will be available in an

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Ohio MAGNETS

advisory and consulting capacity. **Ralph H. Weir,** who has been vice president and secretary for over 20 years, will continue in these positions.

William P. Howlett was elected executive vice president, **National Enameling & Stamping Co.,** Milwaukee. He resigned as vice president, Carl Byoir & Associates, public relations and promotion agency. **Emmett G. Gardner** was elected first vice president, and **James F. Howard,** vice president and secretary of the corporation, assumes additional responsibility of financial vice president.

WILLIAM P. HOWLETT
. . . Nesco, executive vice president

E. E. Howe has rejoined **Chicago Vitreous Enamel Product Co.,** Cicero, Ill., in a special staff assignment.

S. F. Hettinger was appointed sales representative in the Michigan territory by **Ferro Enamel Corp.,** Cleveland, for its Vedoc industrial organic finishes.

Charles Schramm retired June 30 as sales manager, **Fort Duquesne Steel Co.,** Pittsburgh, after 48 years of service to the steel industry. Before joining Fort Duquesne in 1945, Mr. Schramm was manager of sales, secondary products division, Carnegie-Illinois Steel Corp., Pittsburgh.

Henry E. Heilman, operations manager, **International B. F. Goodrich Co.,** a division of B. F. Goodrich Co., Akron, was named vice president-sales of the division. He succeeds **William E. Ireland,** now a sales executive in B. F. Goodrich Co. of Canada Ltd.

C. Douglas Porch, president, **Kinetic Chemicals Inc.,** affiliate of E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., will retire July 31. He has been with DuPont and Kinetic Chemicals for more than 43 years.

J. R. Keach, general manager, **Quaker Rubber Corp.,** Philadelphia, division of H. K. Porter Co. Inc., was elected a director and vice president.

Lee C. Simmons was elected comptroller of **National Tube Co.,** Pittsburgh, subsidiary, U. S. Steel Corp. He succeeds **S. B. Kingham,** promoted to assistant comptroller of the parent company.

F. Ray Friedley was elected a director and comptroller, **Geneva Steel Co.** and **Columbia Iron Mining Co.,** subsidiaries of U. S. Steel Corp., Pittsburgh. He succeeds **C. B. Vernooy,** elected assistant comptroller of U. S. Steel Corp. of New Jersey in New York.

W. T. Cushing Jr. was appointed manager, drilling equipment sales, **National Supply Co.,** Pittsburgh. He will have headquarters in Toledo, O., and succeeds **W. R. Ryburn,** appointed manager of sales, seamless products, for Spang-Chalfant Division. Mr. Cushing has been division sales manager, Northwest and Canadian districts.

W. T. CUSHING JR.
. . . National Supply, drilling equipment sales

Royden C. Presley was appointed district sales manager of the Birmingham area of **Allegheny Ludlum Steel Corp.** He was manager, Toledo, O., district sales office. He succeeds **C. H. Vaughan,** resigned.

Chester Bland was elected to the board of directors, **Leland Electric Co.,** Dayton, O. He is president of Ohio Electric Mfg. Co., Cleveland, and of H. P. Townsend Mfg. Co., Hartford, Conn.

Albert S. Cheyne was appointed district manager of the new Kansas City, Mo., office of **Pressed Steel Tank Co.,** Milwaukee.

Gordon W. Harry was appointed experimental engineer in charge of fuel pumps, **AC Spark Plug Division,** General Motors Corp., Detroit. He succeeds the late **Abraham M. Babitch.**

Artisan Metal Works, Cleveland, promoted **Robert C. Webster** to sales manager; **Arthur A. Hasenpflug,** plant manager; and **Henry P. Gottschall,** controller.

W. J. Laird was appointed superintendent of equipment, Feeder Division, **Westinghouse Electric Corp.,** Pittsburgh. **G.J. Miklos** succeeds Mr. Laird as superintendent of the Linhart foundry, mill and forge shop.

John C. Coonley was appointed assistant manager, Valve Division, **American Car & Foundry Co.,** New York. He will have headquarters in Detroit. Mr. Coonley previously was with Heald Machine Co., Worcester, Mass., joining that company in 1940 as assistant works manager.

Nox-Rust Chemical Corp., Chicago, appointed **Dr. Murray Senkus** director of research and development. He formerly was with the research department, Commercial Solvents Corp.

Edward P. Buchanan was appointed manager, pig iron division, **Pittsburgh Coke & Chemical Co.,** Pittsburgh.

EDWARD P. BUCHANAN
. . . Pittsburgh Coke & Chemical mgr. pig iron

He has been in the company's sales organization for 12 years with the exception of two and one-half years as assistant to the chief of the pig iron section, War Production Board.

F. B. Newcomb and **J. F. Matteson**

O. B. STAUFFER
. . . manager, advertising division, AS&W

JOHN E. McGRATH
. . . manager, market development, AS&W

ELLWOOD J. GEBHART
. . . market requirements, Henry Disston

were appointed assistant managers of sales for, respectively, the Central and Pacific divisions of **American Can Co.**, New York.

American Steel & Wire Co., Cleveland, subsidiary, U. S. Steel Corp., announces establishment of separate advertising and market development divisions in the general sales department. Appointed as manager of the advertising division was **O. B. Stauffer**, and as manager of the market development division was **John E. McGrath.**

Dr. Lewi Tonks, physicist in the research laboratory, General Electric Co., Schenectady, N. Y., was appointed head of the physics division in Knolls Atomic Power Laboratory, which GE operates for the Atomic Energy Commission.

Fred Thatcher, chief chemist, Carnegie-Illinois Steel Corp.'s Clairton, Pa., by-products coke plant, was elected president, **Eastern States Blast Furnace & Coke Oven Association.** He succeeds **D. P. Cromwell**, blast furnace superintendent at River Rouge, Mich., for Ford Motor Co.

Edwin A. Hamala was appointed assistant sales manager, **Royal Vacuum Cleaner Co.**, Cleveland. He joined Royal's executive sales staff in February, and has a long career in the electrical appliance field.

Walter Muller was elected a director, **U. S. Spring & Bumper Co.**, Los Angeles. **John Rauen Jr.** was elected vice president and treasurer.

United States Stoneware Co., Akron, appointed **G. W. Fine** as assistant sales manager, plastic coatings division.

Le Roi Co., Milwaukee, named **T. O. Liebscher** executive vice president. He has been secretary-treasurer since 1940, and will continue in that position. He also was elected to the board to succeed **George E. Phelps**, resigned.

Emil G. Best, sales promotion manager, **Thor Corp.**, Chicago, was promoted to advertising manager.

Ellwood J. Gebhart, a veteran of 42 years in production and sales with **Henry Disston & Sons**, Philadelphia, was named manager of the firm's market requirements department. He succeeds **William P. Gillespie**, appointed sales manager, Chain Saw Division.

Murray L. Schacter was appointed northeastern divisional sales manager, **Diamond Silversmiths Ltd.**, subsidiary, Ekco Products Co., Chicago. He will have headquarters at Ekco's New York office.

James C. Smith Jr. was elected president, **James Campbell Smith Inc.**, Willoughby, O., to fill the vacancy left by the death of his father. **John H. Smith** was elected vice president and general manager.

H. L. Bilsborough was named West Coast director of sales, water heater division, **A. O. Smith Corp.**, Milwaukee.

Mert M. York was named manager, Boston district office, **Allis-Chalmers Mfg. Co.**

OBITUARIES . . .

E. J. Dailey, 62, manager, power apparatus sales, **Graybar Electric Co.**, New York, died June 20 of a heart attack at his home, Pelham Manor, New York.

Richard G. McElwee, iron foundry division manager, **Vanadium Corp. of America**, Detroit, died June 21 in Niagara Falls, N. Y. He had been connected with the corporation since 1936. Mr. McElwee had served as chairman, Gray Iron Division, American Foundry Society, and chairman of its Cupola Research Committee.

Harry J. Gerlach, 64, retired manager of manufacturing, electric sink and cabinet division, **General Electric Co.**, Schenectady, N. Y., died June 15. He retired a year ago after 34 years with GE.

O. J. Schulz, 54, assistant general sales manager, **Deere & Co.**, Chicago, died of a heart attack June 20. He had been with the Deere organization 38 years.

Charles H. John, 83, founder and former president, **Wisconsin Motor Mfg. Co.**, Milwaukee, which became the Wisconsin Motor Corp., died June 17 after a long illness.

Charles I. Day, 68, president, **W. & L. E. Gurley**, engineering instrument manufacturer, Troy, N. Y., died June 22 after a long illness. He had been head of the company since 1926.

Joseph A. Krugler, 50, vice president of **Taylor-Wharton Iron & Steel Co.**, High Bridge, N. J., died June 19 at his home in Easton, Pa. He joined the company in 1924, and became a vice president in 1942.

Le Roy E. Gruett, 44, foreman of the experimental engineering laboratory, **Falk Corp.**, Milwaukee, died June 19.

Henry F. Whitcomb Jr., 66, president, **Richardson Ball Bearing Skate Co.**, Chicago, died at his home in Milwaukee June 20.

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Production AND Engineering
NEWS AT A GLANCE

WELDER CUTS HANDLING TIME—Handling time of coiled strip and sheet at the Waterbury, Conn., plant of Waterbury Rolling Mills Inc., is substantially reduced by means of the inert-arc welding process. The company uses the welding method to join as many as six short coils into one—welding them end to end. Formerly, the short coils were handled separately in rolling and processing operations. The new technique also is benefitting Waterbury customers who get longer, uninterrupted runs on their machines. Welds made by the machine are so smooth that no machining is necessary.

TOUGHENS ALUMINUM'S "HIDE"—A coating for aluminum that makes it twice as wear-resistant as case-hardened steel is reported by Glenn L. Martin Co., Baltimore. The finish designated as MHC is applied by an electrochemical process. For average jobs it is spread on about two-thousandths of an inch thick. The Martin-developed finish is said to make it possible for the first time to use lightweight aluminum for many items that formerly required heavier metal. Although developed primarily for aircraft use, the finish is proving successful on such items as gears and pinions, hand tools and instruments.

SIMPLIFIES GRINDING— Best results in cutting wide forms on screw machines are obtained if the carbide tool is broken up into several simple components, J. S. Gillespie of Carboloy reports. This, he says, simplifies tool grinding and decreases the peak power requirement for forming. The simpler form tools also can be obtained by simply regrinding standard catalog tools, reducing tool costs. Usual objections to breaking up of form tools, he states, do not apply to carbides since carbide tool life is longer, downtime less; and possible increases in setup complications can be offset by use of calibrated toolposts and tool slides, cartridge type tool holders, and setting gages.

TRIPLE DECK SERVICING—At Erie Railroad's new Cleveland diesel shop, work on the diesel locomotives in the repair center is done at three levels, and at one time. All work on running gear is done in a pit while on another level, about 3 feet below the track, shopmen check lower exterior mechanism and lubrication. A third level, about cab-door height, makes it possible to get at the upper areas of the engine. The three-level operations speed up both inspection and repair work considerably. Another time saver here is a giant 29-ton floor controlled bridge crane. With it, Erie employees can remove and replace a 25-ton diesel power unit almost as quickly as a garageman can replace an auto engine.

NEW AID FOR PLATERS—Sawdust and other methods employed by manufacturers and platers in drying finished metal products can be literally tossed out the window. Chemclean Products Corp., New York, reports development of a water remover that assures perfectly dry surfaces on plated work or on polished pieces that are rinsed before storing or lacquering. The remover, the company says, is easy to use. Work is immersed in it after the final rinse, gently agitated and removed. Displaced water falls to the bottom of the container, leaving the work free of stains but covered with a slight film. This is easily removed by vapors of a degreaser.

NO LILY GILDING — Chromium plating stainless steel assemblies may sound like gilding the lily but actually the procedure is practical in automotive applications. It is practical for two reasons—because stainless sections do not exactly match chromium plated hardware and moldings colorwise, and because in some climates unplated stainless develops a slight tarnish, detracting from its lustrous appearance. Procedure worked out at Briggs in Detroit operates on a mechanized basis. (p. 82)

BOOSTS PRODUCTION — To meet customer demands for its tracer controls, Monarch Machine Co., Sidney, O., now operates a special department in the plant to carry out final operations. Besides increasing production, the "tenths department", as it is called, finish machines the elements to tolerances considerably closer than those attempted under ordinary shop conditions. Components are made to tolerances ranging from 0.0001 to 0.0003-inch total. Even longitudinal dimensions between lands of valve sleeves and stems are held within exacting limits. (p. 85)

CUTS ZINC LOSS — Application of low frequency electric induction principles to production galvanizing holds zinc loss to a small fraction of the previous metal loss patterns and concentrates great working capacity in a small area. In an initial installation, Edward W. Burd, metallurgical engineer, Ajax Engineering Corp., reports formation of zinc-iron dross at galvanizing temperature of 850 to 860° F was reduced between 60 to 80 per cent. Below that temperature, dross was almost eliminated. (p. 88)

SHUNTS SHELLS 3 WAYS — Outstanding improvement in the modernized Gary works of National Tube Co. is the No. 3 seamless tube mill which features continuous rolling on a mandrel and incorporates the stretch-reducing process in twelve separately powered stands. The unit, capable of producing both seamless and welded specialty steel tubing in sizes of ½ to 9 inches outside diameter, is a pushbutton installation that can shunt pierced shells from the piercing mill in any one of three directions. (p 94)

How Briggs Chrome Plate

By HERBERT E. HEAD
Electroplating Department
Briggs Mfg. Co.
Detroit

Chromium plating stainless steel assemblies may sound like gilding the lily but it is practical for automotive use—in matching chromium plated hardware colorwise and retarding rust. Parts are turned out in volume production by a mechanized system

CHROMIUM plating stainless steel may sound like gilding the lily, but it has become a widespread practice in fabricating decorative trim for automobiles because stainless steel sections do not exactly match chromium-plated hardware and moldings colorwise. Furthermore, in some climates unplated stainless develops a slight surface tarnish or rust detracting from its desired lustrous appearance.

When asked to undertake the manufacture of a welded assembly of light-gage stainless steel with an electrodeposited flash coating of chromium for the radiator grille of a popular make of passenger car, Briggs began experimenting to determine how the job could best be done. Considering that chromium baths have a low throwing power and stainless steel has relatively low conductivity, plus the fact the assembly involved was some 5 feet long and 2 feet high with a considerable number of recessed areas, the development of suitable production technique was no simple task.

Calls for Automatic Equipment—Among first considerations was a production demand of 3000 units daily, indicating need for automatic-type equipment. The large size of the assembly dictated an unusually

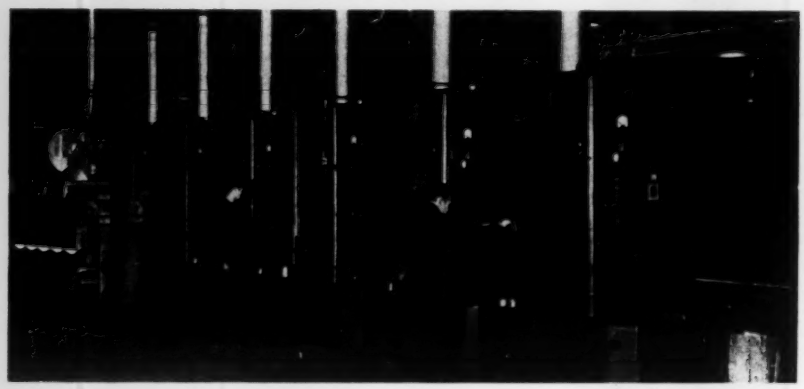


Fig. 1—Six-station abrasive belt polishing equipment which "scours" one surface of flat sheets, strip or blanks. Belts are fully enclosed in cabinets vented to an exhaust system

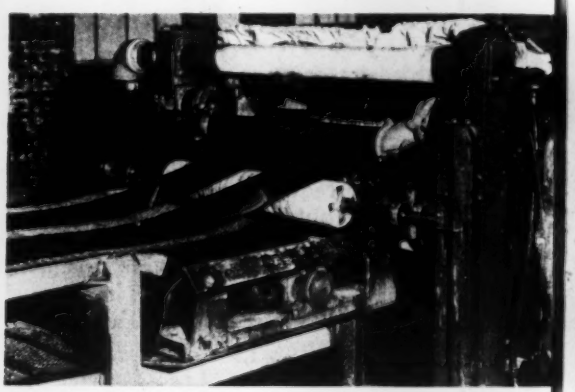


Fig. 2—Roller coating machine which applies water-soluble transparent plastic film to polished surface. Steel then moves into drying oven

Fig. 3—Formed pieces are run through washer and dryer in which soluble coating is removed quickly

ainless Assemblies

large plating installation. Plating racks would need to be at least 5 feet in length and would have to be equipped with auxiliary anodes to insure deposition of plate in recessed portions of the work. High currents required large copper conductors to assure proper distribution of power. This meant racks too heavy to remove from a plating machine.

Size and shape of the plating rack directly governs size of the plating tank and thickness of the required deposit, together with the length of the rack, determines the length of the plating tank. This, in turn, proportionately controls the sizes of all tanks in the cycle, especially the cleaner tanks.

Other questions arose. Was it advisable to clean electrolytically, or should the assemblies first be soak cleaned? If electrolytically cleaned, should the system be anodic or cathodic? In pickling, what acid should be used prior to plating?

Unexpected Results Bob Up—Some rather unexpected results were obtained from experiments with pickling baths. At first it was thought hydrochloric acid should be used, as it would lessen danger of disturbing the balance of ratio in the chrome bath. However, it was found that while this eliminated one danger, another arose—the undesirable introduction of chlorides in the plating bath. Use of many acids was investigated. It was finally found best results were realized with a solution of about 1 per cent sulphuric acid and 0.1 per cent muriatic (hydrochloric) acid.

Preparing parts for assembly and plating presented certain difficulties. Chrome plating on stainless steel requires careful consideration of the type of steel involved. Each of the dozen or more standard grades, and the many more special types poses its own problem in finishing. Common grades of stainless are classified as martensitic or hardenable chromium; ferritic or nonheat-treatable chromium and austenitic or nonheat-treatable chrome-nickel. The latter type of steel is used for the application that is herein discussed.

The same equipment used for grinding, polishing and buffing plain carbon steel may be adapted to stainless steel. Generally, a speed of 6000-8000 surface feet per minute is recommended for grinding and pol-

Fig. 4—Color buffing is done principally on fully automatic return-type buffing machines, special fixtures on conveyor accommodating individual pieces

Fig. 5—The grille assembly is spot welded in the fixtures that are shown here before it is removed by conveyor to the plating department

Fig. 6 — Heavy racks with large copper bussbars to insure adequate current distribution are loaded to convey assembled grilles through cleaning and plating cycle

ishing, and a speed of about 10,000 surface feet per minute for buffing.

"Light Touch" Does Trick — Stainless steels are overheated easily in these operations because of their low thermal conductivity and high abrasion resistance. Thus the operator must bear in mind that too much pressure on the wheel possibly will cause distortion of the part, galling or scoring. For grinding and polishing it is advisable to use only fused aluminum oxide abrasive grain or silicon carbide grain wheels. For a mirror finish, essential in automotive applications, stainless steel coloring rouge (green chromic oxide or unfused aluminum oxide) should be used.

In preparing stainless steel for plating, it was found difficult to polish out any fine pickle or rolling scale after a part was formed. Cost of hand polishing is exceptionally high. Thus the more it can be eliminated the lower the final cost of the part. Hence it was decided to prepolish the stainless sheets before blanking and forming the pieces of the assembly, coating them with a plastic film after polishing to avoid marring during subsequent handling and forming operations. This technique, STEEL, April 17, p. 76, is practiced by another automobile manufacturer.

Six Machines Do Polishing—Sheets are passed successively under a series of six vertical abrasive belt machines, Fig. 1, the belts having progressive degrees of abrasive fineness. Sheets travel on a conveyor through the six units, and only the upper surface is polished since this becomes the outer face of the part where the high finish is desired. Either full sheets, strip or blanks can be fed through the polishing units, depending upon the size and shape of the part into which they are to be formed.

After polishing, flat pieces are passed through a washer, then rinsed and dried in an oven. The water-soluble plastic coating is applied in a roller coating machine, Fig. 2, and the steel immediately passes into a second oven held at about 350° F to "cure" or set the coating. Emerging from the oven the coated sheets are stacked on pallets for transfer to the stamping department, in another Briggs plant.

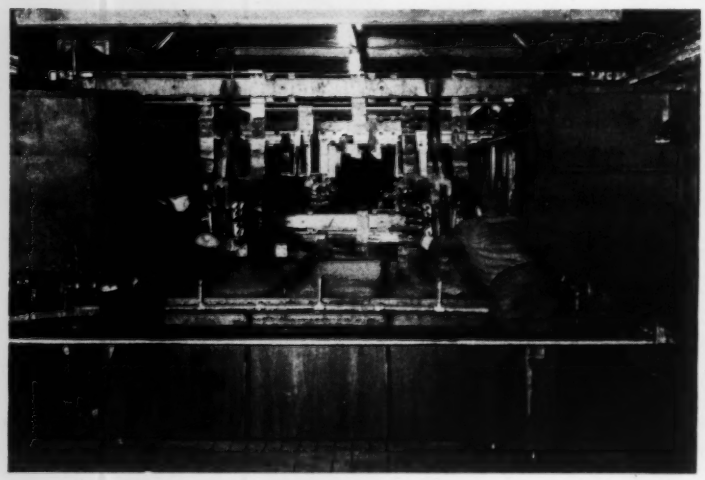


Fig. 7—Soak cleaning, anodic cleaning for 2.25 minutes, acid dip for 45 seconds and chrome plating for 4 minutes, supplemented by soak and pressure rinses, are basic steps in plating cycle

Coating "Stripped" with Water—The dozen or more individual components of the grille assembly are formed in conventional press equipment and proceed in tote boxes to the color buffing department. Before being stacked in the boxes the water soluble coating is removed from the pieces in a conveyorized washer and dryer, Fig. 3, from which they are removed and carefully stacked in boxes, with protective paper between layers to minimize danger of scratches. Parts next are color buffed to a mirror finish on return-type fully automatic buffing machines, Fig. 4, supplemented by some hand buffing on areas out of reach of the automatic buffers.

Hooked on overhead conveyors, grille elements move to assembly stations where they are positioned in fixtures and spot welded, as shown in Fig. 5. Another conveyor transfers the complete grilles to the plating department, Fig. 6, where they are loaded on racks which move them through the cleaning and plating solutions.

Parts Soaked Before Cleaning — Experience indicated the advisability of soak cleaning parts to be plated before immersing them in the electrolytic cleaner where they are cleaned anodically. Solution used in the soaking tank consists of 4 ounces per gallon Wyandotte M. K. emulsion and 4 ounces per gallon tetrasodium pyrophosphate. Solution in the anodic cleaning tank is 3 ounces per gallon Wyandotte B. N. electrocleaner, used at current density of 5 amperes per square foot for 2.25 minutes.

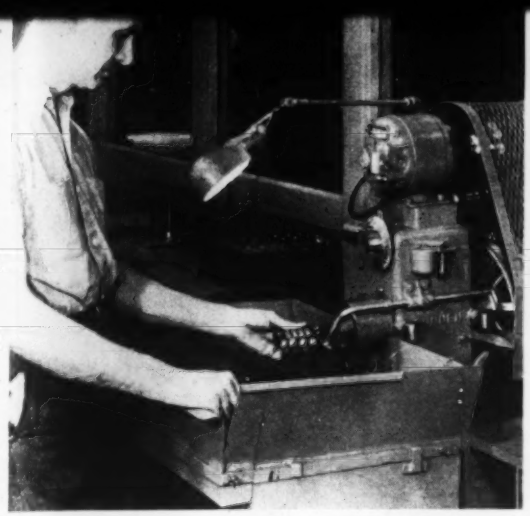
After cleaning assemblies are rinsed thoroughly in a high-pressure spray rinse to insure removal of all traces of cleaner solution. Then comes an acid dip solution consisting of 1.57 per cent sulphuric acid and 0.15 per cent muriatic acid, with 45-second submersion. Following is a soak rinse and then another high-pressure spray rinse before the chrome plating.

Four-Minute Bath—Pieces are moved through the chrome-plate bath for an interval of 4 minutes, solution consisting of 42 ounces per gallon chromic oxide and 0.5 ounces per gallon sulphuric acid, operated at a temperature of 120° F. Out of the plating solution, racks move the parts through a rinse tank where the dragout is salvaged for use as makeup in the plating tank.

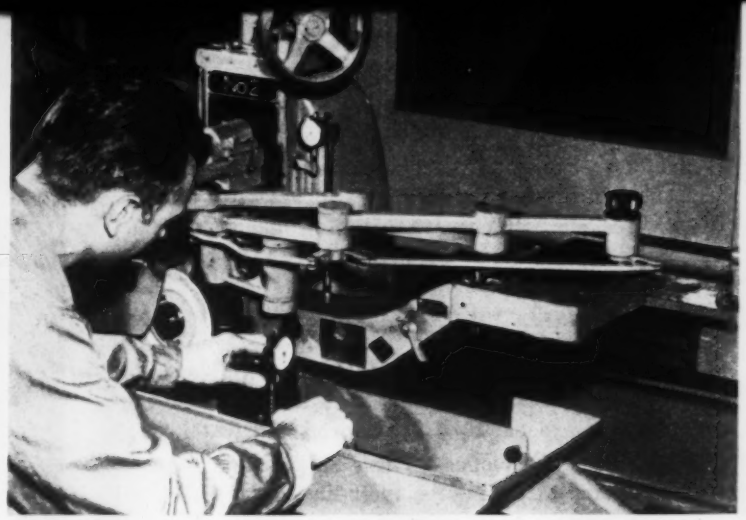
Soak rinse, spray rinse and a final hot rinse complete the operation and the plated grilles are removed from the racks, Fig. 7, and placed on overhead conveyors for subsequent inspection and transfer to body assembly stations. The plating racks travel overhead and back to the loading station.

Certain points to remember in plating stainless steel were noted in experience with the preceding operations. Unless all trace of pickle matte is removed in the polishing operation work will come out of plating tanks cloudy or gray. A properly cleaned stainless steel surface rapidly becomes passive in air and in many other oxidizing environments. Therefore it is important that work be plated as soon after color buffing as possible. If parts are stored more than 20 hours after color buffing, considerable difficulty will be experienced in plating them.

Appreciation for assistance in preparing this discussion is expressed to Kenneth M. Huston, Armco Research Laboratories, Baltimore, and to Don Austin and Sam Piken of the Briggs technical staff.



Surfaces of Air-Gage tracer parts (stainless steel, 55 to 58 Rockwell) are finished to 1 to 2 microinches on this Sunnen hone



Checking valve sleeve metering port following precision operation on Brown & Sharpe surface grinder equipped with Moore Panto-Crush dresser

"TENTHS DEPARTMENT" Eliminates Selective Assembly

Technique of machining and gaging developed by Monarch for increasing production of lathe tracer controls provides considerably closer tolerances than those reached under ordinary shop conditions

By ALFRED J. SHERMAN
Plant Superintendent
Monarch Machine Tool Co.
Sidney, O.

SIGNIFICANT trend in precise production machining is the application of tracer-controlled duplication to a wide range of straight or contour turning, boring and facing operations.

Jobs on which impressive records are being scored include locomotive link pins and axles, shafts of various types and sizes, convex and concave lens laps, reeling plugs, impeller shrouds and exhaust valves.

After several years of pioneering work on these and other applications of tracer-controlled machining, Monarch Machine Tool Co., Sidney, O., developed the Air-Gage tracer for which there now is a growing demand. To meet this demand, the company has introduced manufacturing refinements for greatly increased production to such close tolerances that selective assembly can be avoided. At the same time it has been necessary to provide more comprehensive tests and checks—under controlled conditions—of tolerances and of performances of the completed units.

The "Tenths Department"—These objectives are being realized through setting up a distinct manufacturing area in the plant as a specially equipped valve department wherein final operation on tracer parts are carried out. Known among employees as the "tenths room" this department receives the semi-machined elements for final finishing to tolerances considerably closer than those previously attempted or attainable under ordinary machine shop conditions.

Because the tracer combines extreme sensitivity of air-gaging with ease of control associated with hydraulic power, its components are logically segregated into two groups and their production handled accordingly. These are the relay valve parts, used in the hydraulic circuit of the device; and correspondingly the elements comprising its air-operated circuit.

Group Breakdown—The first group consists of the valve body, made of 1020 SAE steel, valve sleeve, of stainless steel, valve stem, also of stainless steel, and two phosphor-bronze bushings. The second includes the tracer body itself, made of 1020 SAE steel, pilot sleeve of stainless steel; and pilot stems, also of stainless steel composition. The department is divided into two rooms. Controlled conditions are maintained, with each room held constant at 75° F. Air is filtered and humidity closely controlled.

Components are made to tolerances ranging from 0.0001 to 0.0003-inch total. Even the longitudinal dimensions between lands of valve sleeves and valve stems are held within these exacting limits. Finished surfaces are 1 and 2 microinches on stainless steel of 55 to 58 Rockwell hardness.

Best Equipment Used—Final finishing operations —surface-grinding, honing, boring, facing—are performed with equipment embodying latest improve-

ments. This includes a Sunnen hone, Cincinnati Filmatic cylindrical grinder, Cincinnati tool and cutter grinder, Brown & Sharpe surface grinder, Moore Panto-Crush dresser, Moore jig borer with air-operated precision Vulcanaire grinding head (40,000-rpm diamond wheel), and a Monarch 10-inch EE toolmaker's lathe.

Thirty-two different, separate checks for prescribed finish accuracy are made in the course of production and assembly of parts. For example, each sleeve valve is numbered and recorded in much the same way as are parts of finest precision watches.

Special Gage Developed—These 32 checks are made with standard instruments including Sheffield Precisionaire, and Comparator (shadow gage), Pratt & Whitney Air-O-Limit gage, Brush surface analyzer, and several Federal master gages. In addition there is a special gage devised by Monarch engineers to check accuracy of V-slot location in the valve sleeve.

Production of each relay valve detail of the hydraulic section of the unit—including valve body, valve sleeve, and valve stem—requires its own sequence of finish-machining operations. First, consider the valve body. After this part is roughed out in the machine shop, its locating surface is ground, valve sleeve hole bored, valve body ends faced and valve sleeve hole finish-honed to size.

Finish-honing is of critical importance, inasmuch as the finished hole through the valve body must not only be perfectly round but also free from taper. Valve body is checked in the Brush surface analyzer to 4 microinches.

Six Operations Involved—Valve sleeves are machined and finished in these operations: 1. Rough honing inside diameter, with allowance of 1½-thousandths left for finish. 2. Surface grinding two end faces within 1/10th of being concentric with bore. 3. Grinding outside diameter on Cincinnati Filmatic within 1/10th or less. 4. Grinding four middle holes (3/16-inch) to a total tolerance of 0.0001-inch using precision Vulcanaire grinder head on Moore jig borer. Checking of tolerance with Pratt and Whitney Air-O-Limit gage. 5: Grinding metering ports on each end, using Brown & Sharpe surface grinder with Moore Panto-Crush dresser. Ports have a 90-degree included angle with a ten-thousandths radius at the metering point. Depth must be held to plus or minus

Here 3/16-inch intake port hole of valve sleeve is checked on a Pratt & Whitney Air-O-Limit gage

Checking valve stem land spacing to 0.0001-inch tolerance between lands

0.00015-inch. 6. Finish honing inside diameter to straightness and roundness within plus or minus 0.00005-inch—3 microinches finish.

Valve stems come from the machine shop with centers lapped and threads ground. In the valve department outside diameters and land faces are rough-ground; faces of lands are finish-ground to plus or minus 0.0001-inch tolerance for spacing and outside diameters likewise finish-ground. Finish of bearing diameters is 2.5 microinches or less.

OD Limits Close—Final finish-machining of phosphor-bronze bushings is done on the Monarch toolmaker's lathe. Bushings are turned, faced, and bored. Sheffield comparator is used to check outside diameter, Pratt & Whitney Air-O-Limit to check bore. Limits in both cases are plus or minus 0.00005-inch.

Tracer bodies, rough machined, are all finished except for the pilot hole when they reach the new department. To complete them, pilot hole is bored on the Moore jig borer and body is finished on the Sunnen hone. Final check is made with Sheffield Precisionaire to plus or minus 0.0001-inch tolerance.

Pilot sleeve parts are delivered from machine shop following rough grinding of bore. Subsequent operations in valve department are as follows: 1. Grind air escape slots. Bottom of slots must be within plus or minus 0.0001-inch same plane. 2. Rough hone inside diameter. 3. Grind outside diameter (to plus or minus 0.00005-inch). 4. Finish hone inside diameter to 2.5 microinches and check with Sheffield Precisionaire to plus or minus 0.00005-inch.

For machining pilot stems, Monarch uses this sequence: 1. Rough grind air escape face; 2. rough grind outside diameter; 3. finish grind air escape face; and 4. finish grind outside diameter to plus or minus 0.00005-inch.

Tested for Six Hours—Tracer parts are assembled and inspected following these various finish machining operations. Entire unit is then subjected to a six-hour operations test during which it must at all times check within 0.0001-inch against master test gage.

SEEN AND HEARD IN THE

By GUY HUBBARD
Machine Tool Editor

WHY MACHINES COST MORE: When I hear complaints about high cost of machine tools, my retort is: "You are lucky to be paying so little for them." To provide myself with some ammunition to back up that statement, I have just made a quick inventory of major details on and in the headstock of a well-known make of turret lathe.

Overlooking a lot of minor details—all of which cost the maker plenty of money—my inventory reveals the following major items: One multiple sheave V-belt pulley embodying an electric clutch and brake; four multi-diameter and splined shafts (in addition to the main spindle); 12 top quality antifriction bearings; two double sprockets; one double roller chain; 18 gears and pinions with ground teeth; and two hydraulically operated multiple disk clutches.

Contrast this array of precision machinery with the simple back-geared turret lathe headstock of 30 years ago. There just isn't any comparison. I venture to say that the cost of this 1950 headstock alone ranks well up toward the cost of a complete belt driven turret lathe of comparable type as built in 1920.

When you come right down to it, the hard-headed customer is not so much interested in a detailed description of all this fine mechanism as he is in what all this fine mechanism means to him in terms of better products at less cost, better satisfied operators and more output per square foot of floor space.

There isn't a single detail in this 1950 headstock which does not in some way contribute toward making this 1950 turret lathe "the world's best investment" to the industrialist who purchases it. Translate those details into earning power. Then you are talking the customer's own language. Then you will be selling him on an investment that pays big dividends —not just a more costly "frozen asset."

TRIBUTE TO THE TWIST DRILL: Although the screw conveyor is one of the most ancient of all materials handling mechanisms, it is one of the most recent of those widely built into production machine tools for continuous removal of chips in large quantities.

On this page I frequently have alluded to cases of "overlooking the obvious" in connection with development of industrial machinery. Actually, the screw conveyor has been in use for 100 years for continuous "small quantity" chip removal on metalworking machines—but few people have noticed it. I refer to the spiral fluted twist drill, one of the cleverest and most useful of all inventions in the field of tool engineering.

Before the invention of the spiral fluted twist drill, so called "flat drills" were universally used. These undoubtedly were among the world's worst cutting tools. In the words of Joshua Rose, pioneer writer on machine shop practice, the typical old-time flat drill "had the peculiar ability to drill holes which neither were round nor straight". In addition to that it rapidly became choked up with chips—even though those chips were mere scrapings of metal.

When the twist drill was invented, two purposes were achieved at once and mighty important purposes they were. On the one hand, the new tool was a highly efficient metalcutting instrument. On the other hand, it continuously cleared itself of its relatively heavy chips by "conveying them out" through its twin spiral flutes. Incidentally, this invention in turn inspired the invention of the modern universal milling machine, the original being designed in 1861 by Joseph R. Brown—co-founder of Brown & Sharpe —for fluting these improved drills.

The spiral fluted twist drill in our automotive age is fully as important—and about as little appreciated —as was the lowly horseshoe nail in the age of chivalry. Remember that old saying: "For lack of a nail a shoe was lost; for a lack of a shoe a horse was lost; for a lack of a horse a leader was lost; for lack of a leader a battle was lost—and so a kingdom was lost, all through lack of a horseshoe nail!" Take a look at some of the amazing multi-head, multi-spindle drilling machines used in automobile and aircraft production. You will see exactly what I mean.

NON-ACROBATIC OPERATION: Centralization of controls on modern machine tools has a number of advantages beyond mere operating convenience. It is true that no company today could afford to make acrobats out of its highly paid operating personnel. Even tailstock handwheels on some of the latest model lathes are "angled around" to the side of the tailstock so that the operator can hold the work and run the tailstock center in and out while standing at his regular working station.

Over and beyond such operating convenience are considerations of safety plus the physical impossibility of reaching remote control points under modern conditions of "tight layout". Many of the old "remote controls" are extremely dangerous ones—as for example manual handling of pick off gears and "throwing" of belts.

High speed machine tools—like high speed motor vehicles—demand instant starting and stopping through finger-tip control. No operator today would have time to fumble in the air for a shipper rod, nor could he allow his work to "coast to a stop".

Just as automatic transmissions and hydraulic brakes have done much to speed up motor traffic and at the same time make it relatively safe, so also have electrical, hydraulic and pneumatic controls (including clutches and brakes) made high speed machine tool operation not only practical but also far safer than it used to be when controls were rudimentary in design and uncertain in action.

Induction Furnace Cuts Zinc Loss

Application of low frequency electric induction principles to production galvanizing holds metal loss to a small fraction of previous loss patterns, concentrates great working capacity in small area

By EDWARD W. BURD
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Ajax Engineering Corp.
Trenton, N. J.

FIRST installation of a low frequency induction furnace to production galvanizing operations is turning up advantages in the form of greatly reduced metal losses, no iron pickup from the galvanizing reservoir, no time lag in temperature control, and concentration of great working capacity in a small area.

Production in one galvanizing shop using an Ajax-Tama-Wyatt galvanizing furnace revealed a number of significant facts:

1. Temperature of the spelter bath during galvanizing operations showed a variation of 5° F or less. 2. Formation of zinc-iron dross at galvanizing temperatures of 850 to 860° F was reduced between 60 to 80 per cent. 3. Power consumption was about 100 kw hours per ton of galvanized product.

Furnace a Step-Down Transformer—The furnace is essentially a step-down transformer having a short circuited secondary. The secondary is formed by three vertical and one horizontal channel filled with molten metal.

Normal line voltages and frequencies, usually 440 to 480 v, single phase, 60 cycles, are supplied to the control cubicle. The cubicle contains a bank of static capacitors for power factor correction, the necessary contactors for switching the furnace from high to low voltage for purposes of temperature control, a circuit breaker and auxiliary equipment needed to control automatically the power input to the furnace and thus maintain automatic temperature control.

Output voltage from the control cubicle is connected to the furnace coils by heavy power cables, Fig. 3. The coils (d) are mounted on a laminated magnetic core (b). Secondary channels and the primary coils (a) are mutually threaded by the magnetic core. A low voltage appears across the channels. Since the channels (h, k) form a closed circuit, a current will flow in them. Heat is generated in the metal filling the secondary channels, according to the fundamental law that power equals I^2R.

"Pinch Effect"—Careful study of the physical relationships existing between parts of a low frequency induction furnace shows that there is a force which causes the metal in the vertical channels to be squeezed and, hence, move. Movement of metal from the channels is characteristic of these furnaces and is caused by this "pinch effect".

In the induction furnace, all heat is generated in the molten metal. For this reason it is the hottest part of the furnace. Nothing else need be hotter than the metal in order to effect a heat transfer. In fact, all parts of the furnace are cooler than the metal. This leads directly to less time lag in heating up, and completely eliminates "over-shooting" upon reaching operating temperature.

Drossing Action Reduced—Absolute control of temperature allows the furnace to be operated within a few degrees of the melting point of zinc. Possibility of operating at low temperatures presents the means for effectively reducing the drossing action of the cold work with associated changes in structure, bond-area, and physical characteristics of the coating.

Movement of the molten metal from the melting channels, as outlined above, provides instantaneous heat transfer to the metal in the hearth. This allows high concentrations of power in the unit without danger of over-heating the metal. In standard induction melting furnaces, 2000 to 4000 pounds per hour melting capacity is concentrated in comparatively small reservoirs of 3000 to 4000 pounds.

Inductor on Side of Hearth—An induction galvanizing furnace differs from a melting furnace in that the inductor unit is mounted on the side of the hearth, Fig. 1. The inductor channels are connected to the main reservoir by a throat area. The reservoir is lined with 3 inches of insulation and 9 inches of refractory.

Location of the inductor on the side of the reservoir allows any zinc-iron dross formation to settle to the bottom of the galvanizing reservoir. It also simplifies maintenance, since a damaged inductor can be replaced without emptying the main reservoir.

Construction Details—Sections on U-U and X-Y-Z, Fig. 3, illustrate the construction of the furnace, the details of the induction channel design and the placement of the coils and laminated magnetic core. The outer steel shell of the furnace is represented by (e). Other features are: Insulated construction adjacent to the steel shell (d); refractory linings next to the insulated construction (m); galvanizing reservoir or spelter bath (n) in the section on U-U. The three vertical channels (k) are interconnected by means of the horizontal channel (h), allowing the metal com-

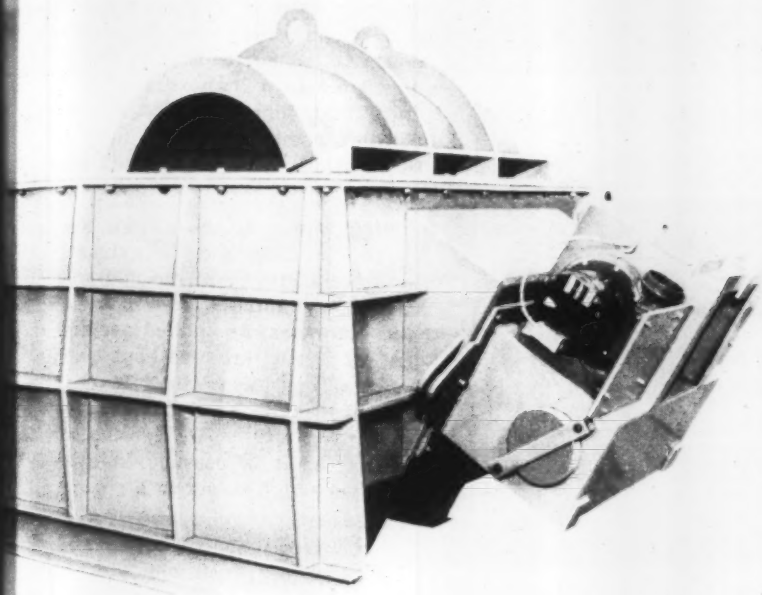

Fig. 1—Induction galvanizing furnace showing how inductor unit is mounted on side of hearth. Inductor channels are connected to main reservoir by a throat area

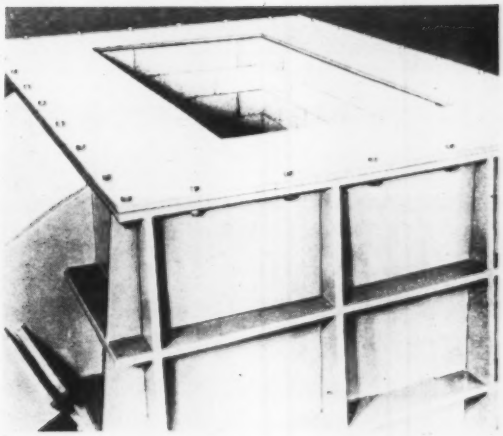

Fig. 2—Refractory lining of main galvanizing reservoir. Portions of throat area and small part of inductor may be seen at left

plete freedom of movement throughout the channel system. Coils (a) are placed between spaces formed by the three vertical channels with the laminated magnetic core (b) forming a complete loop around the center channel of the three vertical channels and traversing through each coil (a).

This proportioning of the channels with relation to the coils and laminated magnetic core allows an optimum circulation of metal through the channel system to all parts of the molten metal system, indicated by the throat area (g) and the spelter bath (n).

Circulation of molten metal throughout the system maintains the temperature of the metal in the galvanizing reservoir (n) within a range of 5° F during galvanizing operations. The circulation of the molten metal from the channel system through the throat area (g) and the main galvanizing reservoir (n) is indicated by arrows in section on U-U.

Starting Procedure — The induction furnace is started by melting down some zinc ingots in the main reservoir by means of an auxiliary gas burner located under a temporary cover. After the metal level has reached the edge of the throat (g), a sufficient number of zinc slabs are added at once to make molten metal overflow to fill the inductor. Then the electric power is turned on and the furnace proceeds to melt zinc by induction at the rate of 20 pounds per hour per kilowatt of applied power. The auxiliary burner is removed and the reservoir filled to the top level. The furnace is then ready for galvanizing operations.

Mechanism of Coating—To evaluate characteristics of the induction furnace, a number of factors involving the mechanism of the galvanized coating must be kept in mind.

The alloy layer immediately next to the steel base has a composition represented by the formula $FeZn_7$ with an iron content of 7 to 11 per cent and a melting point range from 986° to 1238° F. This very important layer has a hexagonal crystal structure and is characterized by its toughness and ductility. Absence of this alloy layer indicates poor adherence. Its outermost portions indicate a lower iron content of 6.25 to 7.0 per cent with evidence of both the hexagonal and monoclinic crystal latttice. This layer merges with another compound containing from 5.75 to 6.25 per cent iron having a melting point of 986° F.

The composition is indicated by the formula $FeZn_{13}$. The stable nature of the compound retards the iron diffusion and acts to seal off the dissolving action of the zinc on the iron.

According to Daesen, in his galvanizing handbook, it is the slow diffusion through this layer which restricts the growth of a galvanized coating with time so that it approaches a constant thickness, the curve of thickness versus immersion time having a parabolic shape.

Thick Layer Fractures—The $FeZn_{13}$ alloy layer is characterized by long columnar crystals of the monoclinic system and this layer is hard and brittle. Daesen says these crystals are long when the coating is done at elevated temperatures. But coatings formed in baths near the melting point or under 830° F usually have short columnar crystals of this $FeZn_{13}$ compound. When this crystal layer is relatively thick, the coating fractures easily on deformation.

The $FeZn_{13}$ brittle alloy layer merges with the outermost layer which consists substantially of pure zinc with a melting point of 787° F and with the ductile hexagonal crystal structure of zinc. The presence of appreciable amounts of cadmium, tin, lead, and iron in the ingot zinc decreases the soft, ductile property of the outermost layer.

Daesen lists the following factors which affect the coating characteristics: Changes in the iron or steel base, changes in the coating metals, changes in the fluxing materials, and changes in operating methods.

Changes in the iron or steel base involve the presence of unusual amounts of phosphorus, unusual

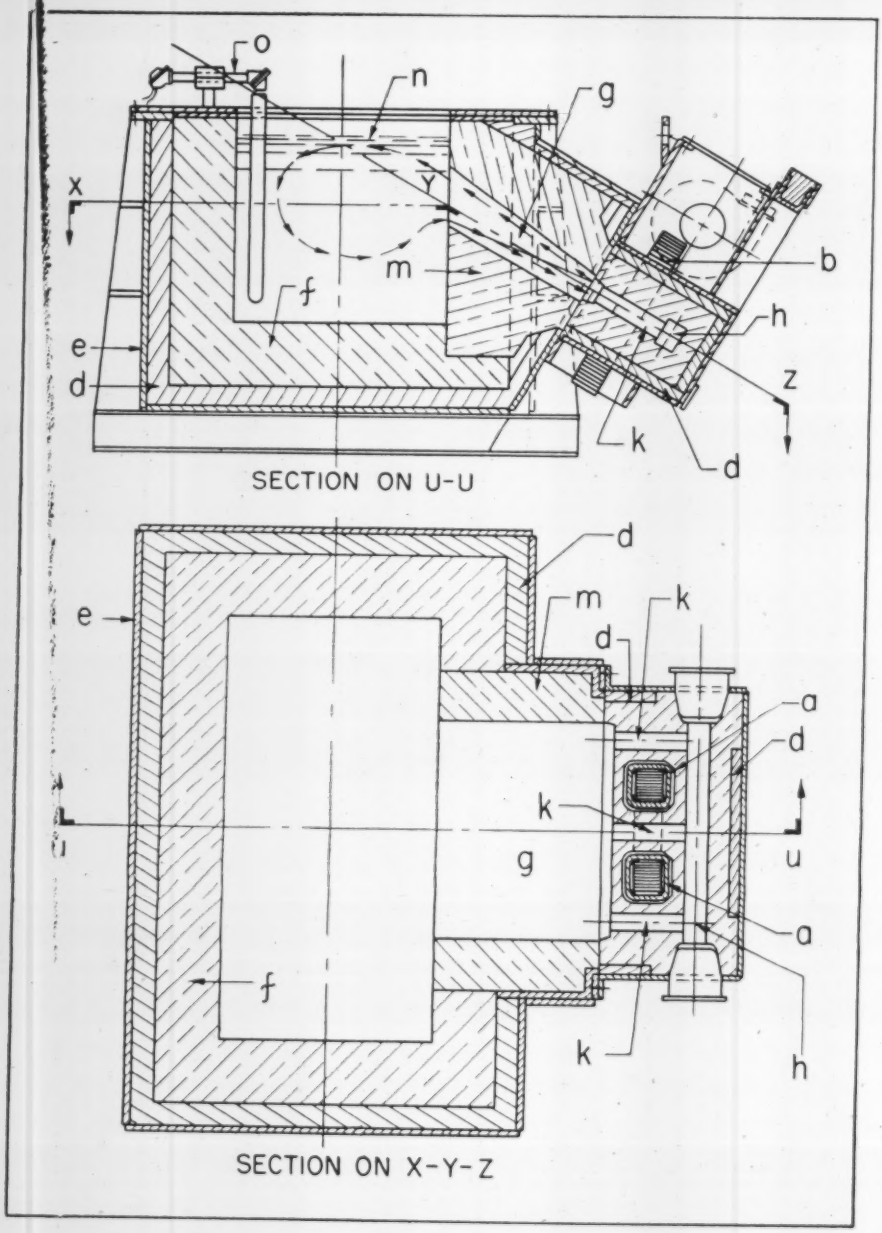

Fig. 3—Drawing showing construction of furnace, including details of the induction channel design and placement of coils and laminated magnetic core. Key to letters is in text

amounts of silicon, variation in carbon content, solid inclusions or porosity near the surface.

Abnormal amounts of phosphorus, silicon, or carbon tend to increase alloy layer formation. Solid inclusions and porosity near the surface tend to break up the alloy layers and distort the outermost layer of pure zinc.

Reaction of Temperature Changes—At galvanizing temperature of 840° F, the ductile $FeZn_7$ alloy layer is present in appreciable thickness, serving as a cushion between the merging brittle alloy layer of $FeZn_{13}$ and the steel base. The coating will withstand severe deformation. At coating temperature of 870° F, the ductile $FeZn_7$ alloy layer is very thin and merges with the very thick brittle alloy layer $FeZn_{13}$. Its deformation properties are somewhat limited.

With coating temperature of 900° F, the ductile $FeZn_7$ alloy layer is discontinuous and nonexistent in spots. The layer of brittle $FeZn_{13}$ is markedly thicker, and this makes for very poor adherence and poor deformation.

Ductility Improvement Possible — The above shows that the formation and thickness of the brittle $FeZn_{13}$ alloy layer is a function of the zinc bath temperature and the immersion cycle. The induction galvanizing furnace for the first time makes it possible to maintain the entire galvanizing bath at temperatures only a few degrees above the melting point; i.e., at 800 to 830° F. The ability to obtain a high volume of production at this controlled low temperature points the way to more ductile coatings with a minimum thickness layer of $FeZn_{13}$.

High Power Enables High Speeds — In a conventional galvanizing kettle of a given size the hourly production is limited by the heat input that can be safely applied per square foot of kettle area without rapidly deteriorating the kettle. In the induction furnace, hourly tonnage within a given size kettle can be much greater, as it is possible to concentrate very high power in a small reservoir.

For example, the speed per minute of a 26 gage 24-inch wide steel strip would be at 25 fpm at 100 kw. If the power applied is 1000 kw, the speed can be 250 fpm. Galvanizing kettles with a rating of 2000 kw are entirely practical.

There are indications that heat transfer to the work by convection is more rapid due to the constant circulation of the melt in the induction galvanizing furnace. This may lead to the use of shorter immersion times in many galvanizing operations.

In view of the high overall efficiency of the induction galvanizing furnace, 70 to 80 per cent, this is the most economical method of heating the work, as compared to electrical preheating by radiation before immersion. One of the reasons for considering such preheating units previously was the inability to obtain sufficient heat input to the galvanizing bath without rapid deterioration of the kettle.

Zinc-Aluminum Alloys—Aluminum additions to the galvanizing bath of the order of 0.25 per cent are being considered increasingly for galvanizing operations. When aluminum is used, the thickness of the brittle alloy is decreased very substantially and the coating will adhere tightly, even under severe deformation.

One of the problems when using this method is the loss of aluminum. This has generally been ascribed to selective oxidation in forming the thin oxide skin which keeps the bath bright. Experience in the induction furnace has shown a much reduced aluminum loss. It is now believed that the loss of aluminum in conventional kettles may be due to the formation of complex zinc-aluminum-iron compounds.

This fact is well known in the zinc die casting field where alloys contain-

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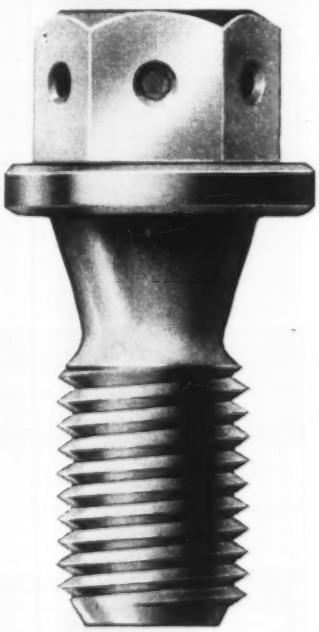

For some time now industry in general has been taking it on the chin from all sides. The attacks have been blessed by many minority groups and endorsed by social planners, most of whom are uninformed and without business experience. Industrialists have been reluctant to dignify the attacks by striking back, but recently several have decided to speak out against unjustified persecution. It is good to see industrial spokesmen defending the American system. The attacks upon it are too systematic to dismiss lightly. We have something worth preserving, and if we *don't* speak out now we may not have it long. The founders of this country believed in free enterprise, and so do we. Through the exercise of this freedom the Chandler Products Corporation has been able to fashion and distribute, at fair prices, fine cold wrought metal fasteners. These products serve to hold a multitude of manufactured products together . . . . and they do it so well that our best salesman has always been the product itself.

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ing about 4 per cent aluminum are used. Here the alloy melt always has a very low iron content, and all iron contamination from the melting pot, tools, and other foreign matter will combine with the aluminum and some zinc to form a mushy floating layer, which is skimmed off from time to time. Analysis of these skimmings show a much higher percentage of aluminum and iron than contained in the melt.

When using iron pots in the preparation or melting of zinc die casting alloys, it was necessary to make frequent aluminum additions to make up for the aluminum loss thus caused by iron contamination. Much smaller additions or none at all were necessary when using an induction furnace for the preparation of these alloys. It is expected that the induction furnace will give similar results in the handling of galvanizing melts containing aluminum.

With the constant circulation of the induction galvanizing bath, uniformity of the alloy content is always assured. Alloying additions can be made very easily. With the induction furnace, it is not necessary to use a zinc-aluminum rich alloy. Pure aluminum bars can be introduced into the induction channels for direct alloying at low temperatures. The alloying action is immediately due to the constant circulation of the metal through the inductor channels.

Welders, Heat Treaters Note

UNFORTUNATELY not all findings from the huge research and development program being conducted by the government can be released, as many of them come under the head of military preparedness. Many are of value to industry, but can be publicized only after very careful screening.

One such development, picked up by STEEL from the Office of Naval Research, is of interest to the welding profession. It results from work done by W. B. Kouwenhoven and T. B. Jones, Johns Hopkins University, Baltimore, under an ONR contract, on fundamental characteristics of the welding arc.

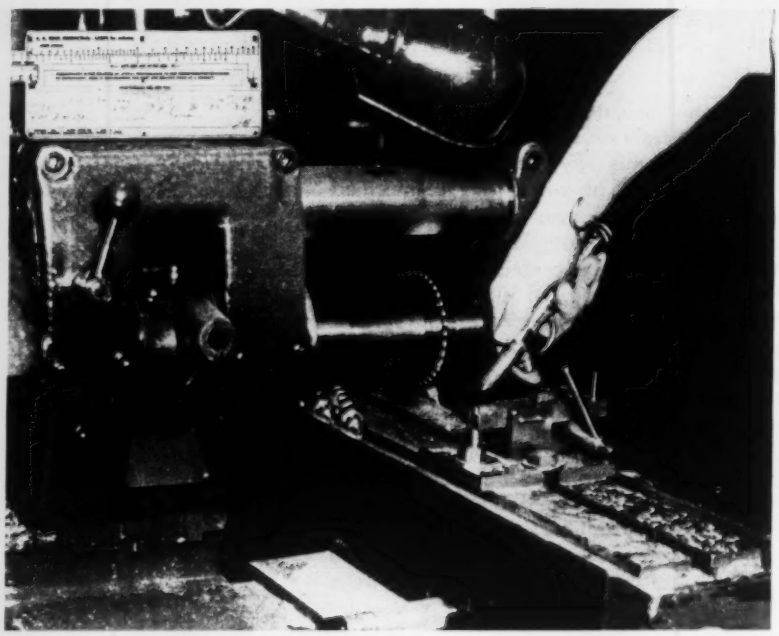
The test setup was arranged by spirally winding metal tape around a cylinder, mounting the cylinder in a lathe, and placing a rod where the cutting tool usually is mounted. The tape was the positive electrode and rod the negative.

Stable Arc Maintained—On rotating the cylinder at various speeds, it was said to be possible to maintain a stable direct current arc at speeds many times greater than normally encountered in usual welding practice; that is higher melting efficiencies were obtained at the higher speeds. This finding is interesting in view of confirmatory findings by C. E. Jackson and A. E. Shrubsall, Union Carbide & Carbon Research Laboratories, that higher energy utilization is obtained during the welding process by increasing the current and speed of travel.

The track left by the arc on the moving tape was not continuous; rather, it consisted of a line of melted spots of uniform size and spacing. In their report to ONR, Messrs. Kouwenhoven and Jones expressed the belief that these anode spot phenomena offer a new approach toward obtaining a better understanding of the factors affecting the welding arc.

Steam May Embrittle — Another finding of value to industry is that the presence of steam in heat-treating atmospheres may result in badly embrittled stainless steels treated in such atmospheres. This was reported to ONR by Dr. C. A. Zapffe, Baltimore, who is carrying on a comprehensive research program on gases in metals.

In one test, a stainless steel, which had excellent ductility as measured by a bend test after heating for 15 minutes in a normal atmosphere, was embrittled when exposed to steam at the same temperature for only 1 minute, to the extent that the bendability was reduced dangerously. The difference in humidity conditions in heat-treating plants, Dr. Zapffe told ONR, may account for hitherto unexplained loss of ductility in stainless steels.



PROFIT MARGIN MAINTAINED: Measuring and signalling performance while a job is running is a production control device, the Productivity-Scope, a development of R. G. Bock Engineers, Chicago. Essentially a plastic unit with scales calibrated in terms of hours worked and hours earned, it holds a recessed "job instruction" slip. Device is attached to each machine or placed on the worker's bench. When hourly output is below standard, a red signal shows; warning is presented in ample time to correct the production trouble and maintain the profit margin on a given operation. With everything progressing at an above-normal rate, a green signal shows. Operating on the slide rule principle, below-standard performance is immediately shown

Is Your Wiring Inadequate?

AN INDUSTRY-WIDE survey made recently showed that 9 out of 10 industrial plant wiring systems are obsolete and inadequate. To be directed to all industrial users of electrical power is a nation-wide industrial rewiring program announced by Anaconda Wire & Cable Co., New York. Program will enlist co-operation of electrical contractors, plant maintenance personnel, electric utilities and wholesalers. Purpose will be to have industry survey the condition of its power wiring systems with the view to modernizing and providing fully adequate distribution capacity.

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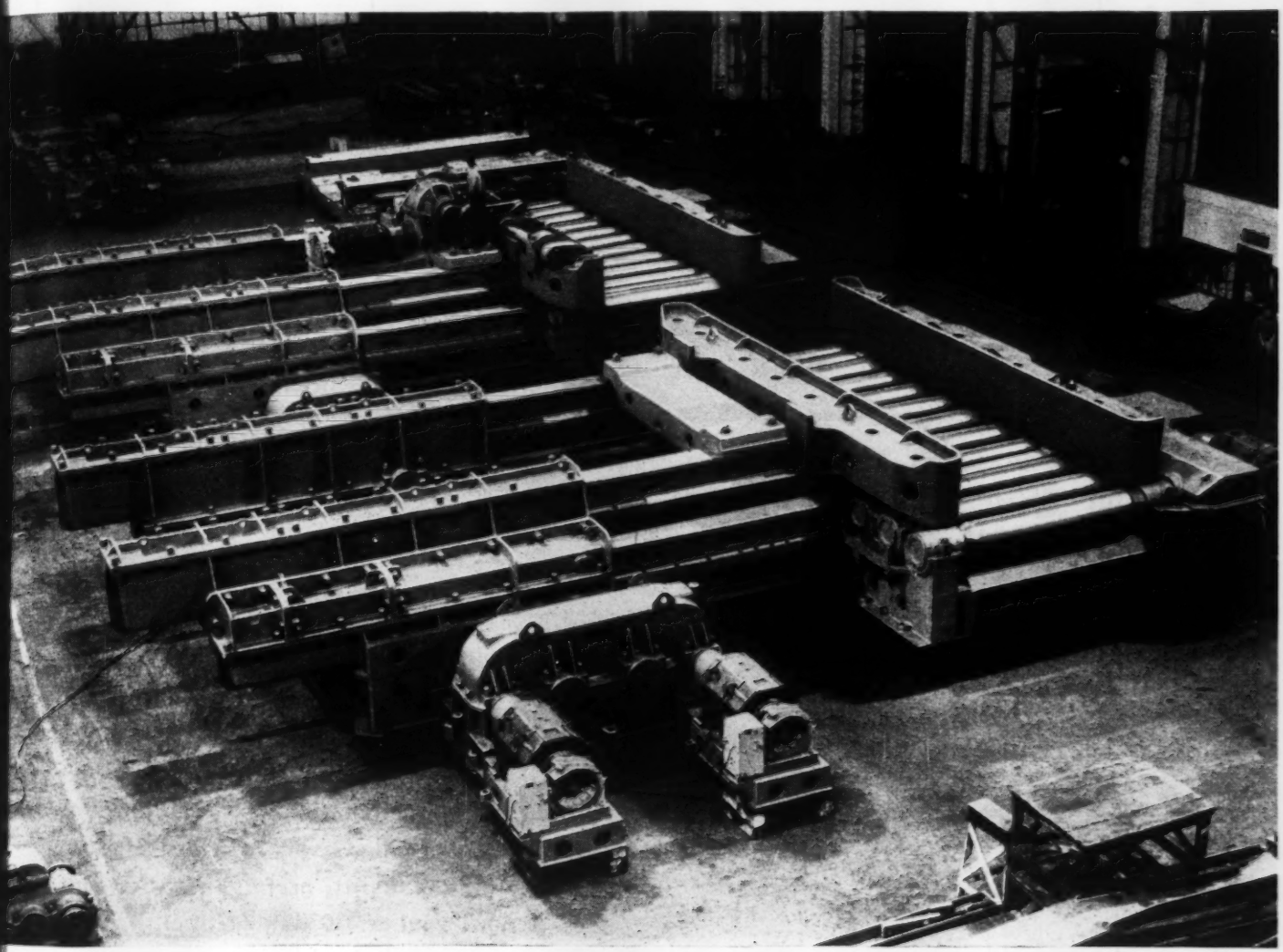

Shop view of 40″ Blooming Mill Manipulator and Mill Tables, furnished with a Morgan 40″ Blooming Mill, having Twin Motor Drive. Manipulator is of the overhead type, electrically driven with retractable heads so the table rollers can be removed without dismantling the manipulator heads.

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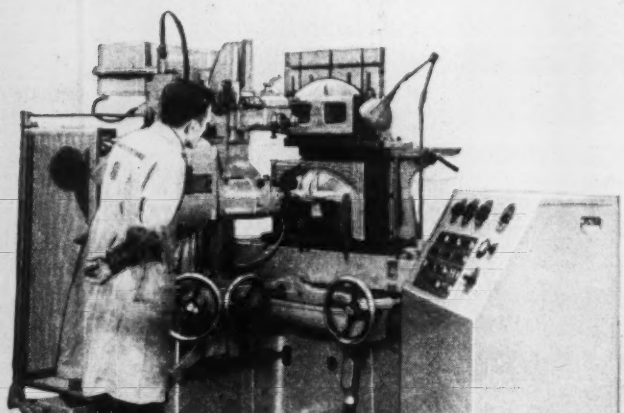

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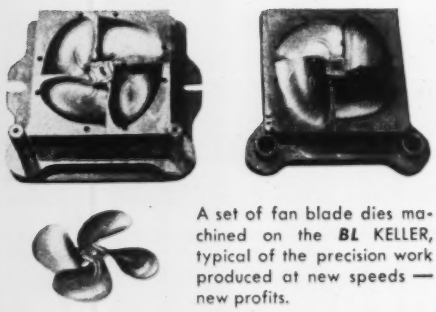

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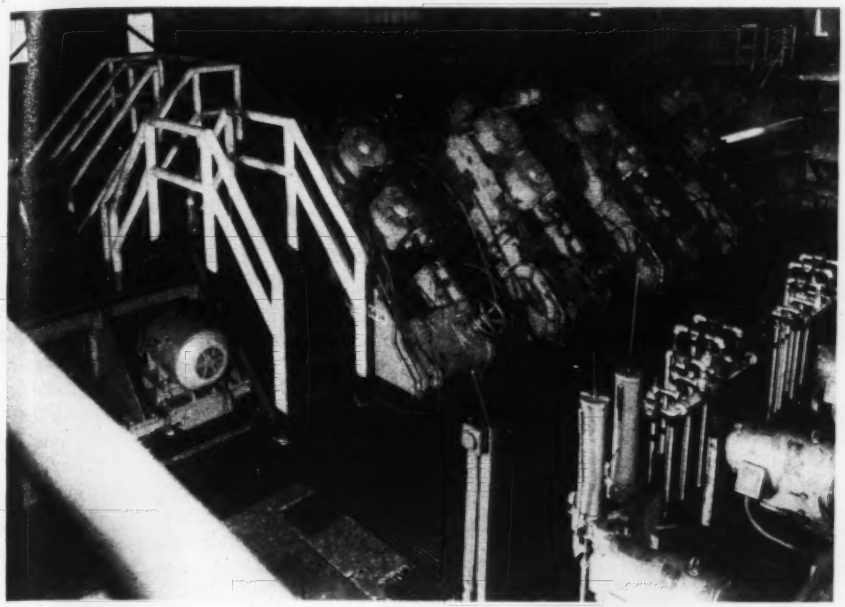


Fig. 2—In this 8-stand continuous mandrel mill the hot seamless tube's outside diameter and wall thickness are reduced before further processing in other units of the new No. 3 seamless mill

There are two separate continuous lines of in-line heating chambers, whose application in a continuous line for heating rounds is new to industry. This is the first installation of its kind ever made. Each consists of 27 chambers, 19 chambers being used to bring the cold rounds up to the desired temperature and eight to hold or soak them to insure even heating.

The 27 chambers in each line are grouped into six separately controlled zones, either gas or oil fired. Tube rounds are charged cold at predetermined lengths and cut to required piercing mill sizes by hot saws located at the end of each furnace line. The tube billets then enter the piercing mill, which is of the conventional Mannesmann-type having the usual inlet and outlet troughs.

From this point the path of the pierced shell is determined by the type of tubing to be rolled. For small-diameter light-wall tubing, a mandrel bar is inserted and both mandrel and tube pass through the 8-stand continuous rolling mill. The bar is then removed and returned for the next tube while the rolled tube passes through the reheating furnace and on through the 12-stand reducing stretch mill.

The reheating furnace is a roll-down type with inlet and outlet water-cooled rollers. The furnace is 48 feet long inside with 3-zone control, equipped with furnace pressure, temperature and fuel controls.

Stands Located at Right Angles—Like the mandrel mill, the stretch-reducing mill is arranged with its successive stands located at right angles to each other, with each pair of rolls inclined 45 degrees to the floor level. The rolls of each stand have semicircular grooves which alternately engage one side and then the other of the shell's circumference. By producing a speed differential between the successive roll stands, tension is produced in the portion of the tube between the stands. This tension stretches the tube and creates a thinner wall and greater length. In this way the stands are rolling the tube continuously thinner while reducing its diameter at the same time.

After leaving the stretch mill the finished tube passes across a cooling table to a multiple cold saw where it is cut into lengths as required. It then moves to the scales for weighing.

When rolling heavy-wall tubing, after leaving the piercing mill the pierced shell by-passes the 8-stand mandrel mill and passes directly through the Assel mill. The mandrel bar is then removed and the tube passes on through the reheating furnace to the 12-stand sizing sinking mill. This mill is conventional with a common motor operating the gear-reduction drives and the line shaft. Again the tube passes to the cooling table and through the multiple saw to the scales for weighing.

Rolls Set on Inclined Axis—When rolling large-diameter light-wall tubing, the shell is passed through the 8-stand continuous rolling mill but the Assel mill is by-passed. The tube is then reheated and passes through the 12-stand sizing sinking mill and through the rotary sizer. The latter is conventional, with the rolls set at an inclined axis. From this mill the sized tube moves to the cooling table, through the multiple cold saw and on to the scales.

The cooling table is 160 feet long and of a rotating screw-roller type. As the tubes are carried across, they oscillate back and forth across the rollers approximately 6 feet.

The new electric-weld tube mills were designed to the operator's specifications to produce tubes from ½-inch to 5 inches OD. There are three, a 2-inch, a 3-inch and a 5-inch, each consisting of a forming section, a

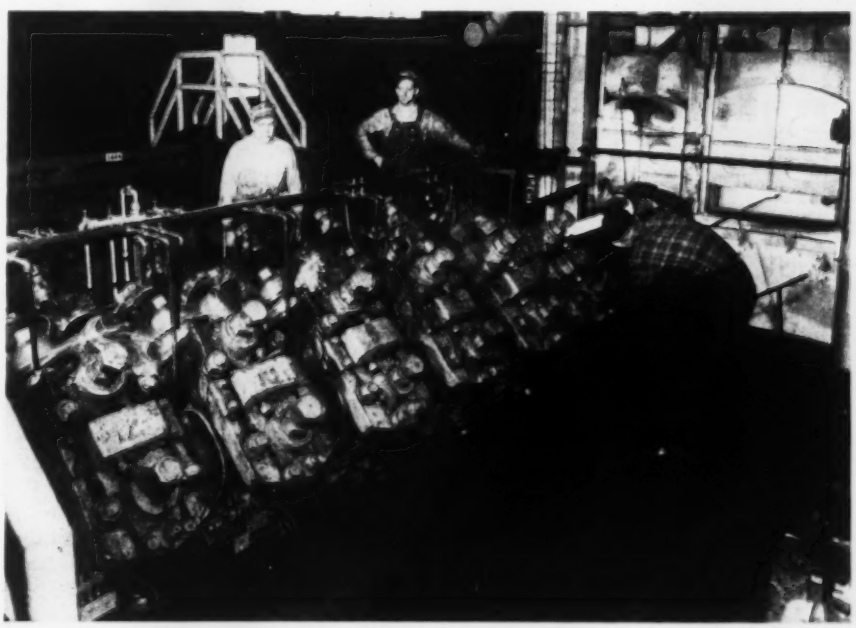


Fig. 3—Stretch-rolling elongates the hot seamless tube and reduces it to specified size. Photo shows a heated tube leaving the reheating furnace and entering the 12-stand stretch reducing mill of the No. 3 seamless mill

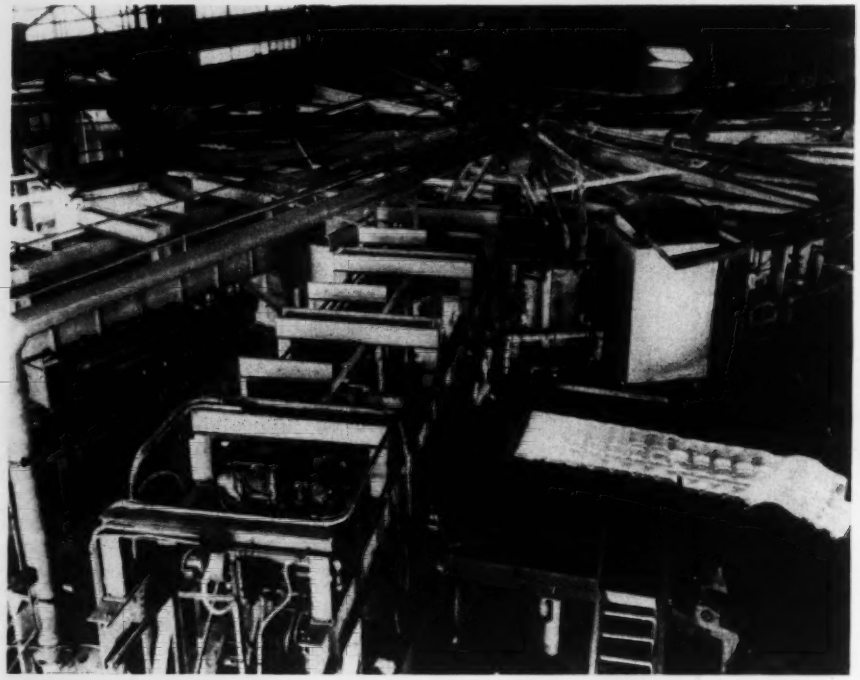


Fig. 4—Overall view of the doughnut-type rotary hearth billet heating furnace in the No. 2 seamless mill which heats the steel preparatory to piercing. Light streak at lower right was caused by a heated billet being transferred to the roller conveyor leading to the piercing mill. Discharging machine is seen in the foreground and charging machine is shown at the left

welding section with a rotary transformer to supply the welding heat, a sizing section for sizing and rounding the tube to specified tolerances, and a rotary-head traveling cutoff. The welding transformers are oil-cooled and are rated at 150 kva, 250 kva and 500 kva, respectively. Each one is suplied from its own generator with 180-cycle current.

Additional Storage Space Provided—Material for the electric-weld mills is provided from wide-band coils slitted to strip of proper size. Storage space is provided for stocking approximately 3000 tons of 36-inch wide coils of about 14,000 pounds each. This material may be either hot-finished, pickled and oiled or cold-rolled rimmed or killed steel, according to trade requirements. Additional space is provided for stocking single-width strip which has been rolled as required for the tube welders.

A complete slitting line, built to National Tube Co. specifications, was installed to handle all strip for the three welders. It is a combination drive and pull-through type slitter capable of preparing material up to 8 Birmingham wire gage (0.165 inches) by 36 inches wide. Handling facilities consist of a coil-loading ramp, an elevating-type charging buggy, a pay-off reel, recoiler, unloading buggy, banding stalls and scrap winder. Proper strip tension between the slitter and the recoiler is automatically maintained by electric controls.

Loopers Afford Continuous Operation—To permit continuous operation of the 2-inch and 3-inch mills, looping and splicing equipment is provided. This equipment includes two splicers, each provided with a hydraulically operated up-cut shear with a clamping arrangement which automatically double shears the strip ends and clamps the squared ends into position for gas welding. The loopers, designed and built at Gary Works, accumulate 300 feet of metal which is paid out to the welders while the strip ends are clamped and welded. Coils charged to the 5-inch mill are rethreaded without end-welding.

Tubes from the electric-weld mills are transferred to the finish floor where rotary straighteners bring them to commercial tolerances. Following this operation they are cut to specified lengths on rotary-head cutoff machines. After passing through a battery of profilers, which end-face and chamfer the outside and inside diameters, the tubes are inspected and packed for shipping.

Stainless Tube Facilities Installed—Because of the exacting performance required of the finished product, an extensive installation for handling and processing stainless tubular products was installed. The stainless production unit occupies a main building, 160 feet by 744 feet long, equipped with facilities of the most modern design. For proper conditioning of the seamless hot-rolled tube prior to cold working, a unit of three abrasive wet-grinding machines is employed to remove surface defects. For further refining the surface, a battery of polishing machines using abrasive cloth belts of various grits is employed.

In a 60 x 80-foot room is located a separate pickling unit provided for "in process" material. The pickler consists of five vats—two steel water rinse tanks, two acid tanks and a salt bath for descaling. The descaling unit is a molten salt bath held at 950° F which, in combination with a water quench, removes all evidence of scale without attacking the metal. After the salt bath the tube is dipped in two acid solutions, followed by a hot-water rinse. Each lift of tubing is handled by an overhead crane controlled from a glass-enclosed room centrally located outside the pickling room.

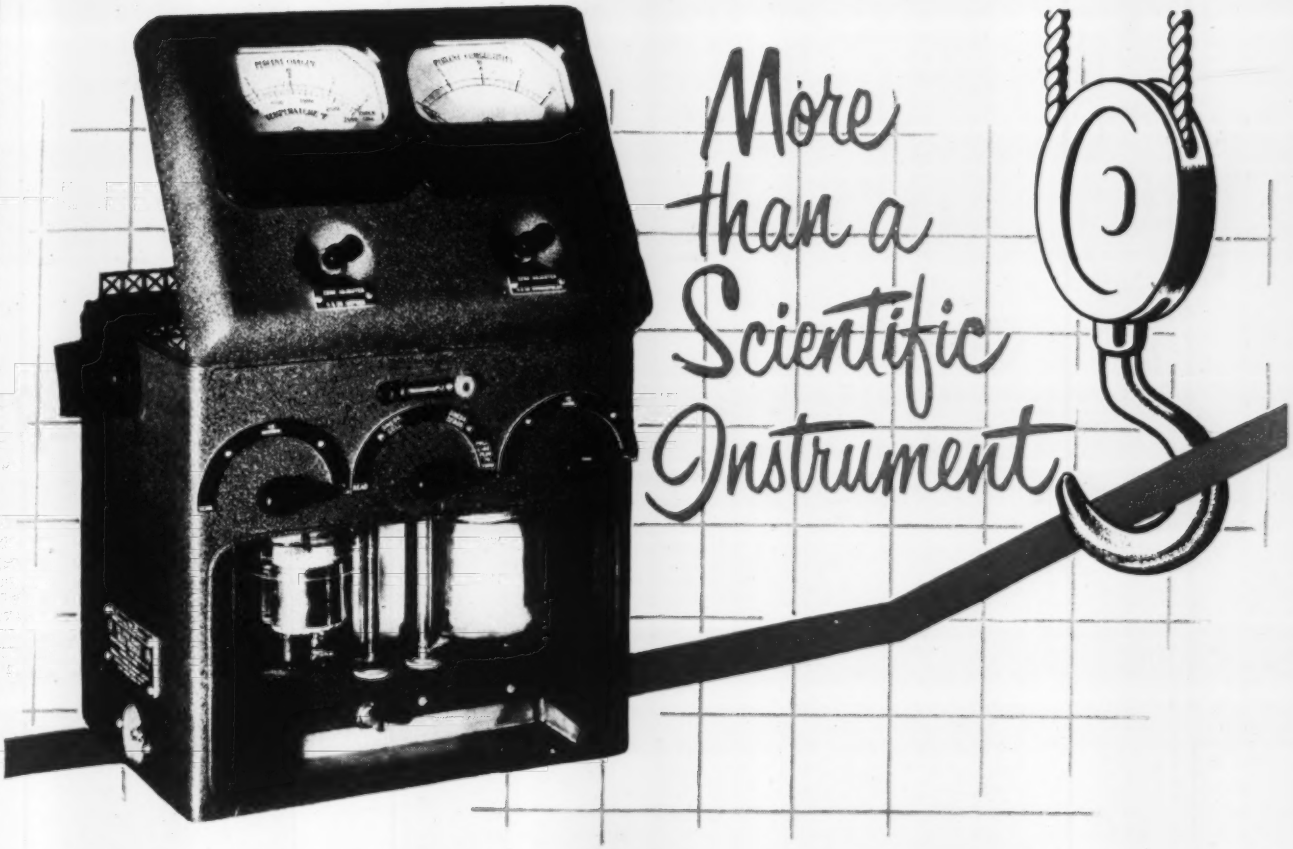
Located beyond the main pickling room, a group of four tanks is available for cleaning and lubricating purposes. Here each load of tubing is cleaned prior to annealing to insure a clean product.

Various Types of Annealing Equipment Provided—Three types of annealing equipment are used to process the wide range of sizes and grades of tubing manufactured. A gas-fired, three-unit, doughnut-type continuous furnace anneals tubing within the range of 3 to 8⅝ inches OD. This furnace has a rated capacity of 1500 to 3000 pounds an hour, depending on the tube's size and wall thickness.

Product below 3 inches OD is annealed in a continuous furnace heated by gas-fired radiant tubes. This furnace, 30 inches wide by 15 feet long, is equipped with water-cooled silicon carbide rolls. It has a rated capacity of 1000 pounds an hour. For small light tubing from ¼-inch to 3 inches OD an electric induction annealing furnace is employed. It has a rated capacity of 500 pounds an hour.

Each of these furnaces can develop temperatures up to 2150 degrees. Sighted on the tube are rayotubes which record and control the material's temperature as it passes from the heating chamber to the water quench at the outlet. Each furnace is equipped with variable-speed conveyors to insure proper treatment of any size processed.

Stainless Tubing Drawn Over a Bar—Stainless tubing 3 inches OD and under is reduced in another department equipped with two 3½-inch tube reducers, three 2½-inch tube reducers and five 1½-inch tube re-



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ducers. Cold-drawing equipment in the stainless department consists of two 50,000-pound and one 150,000-pound drawbenches. One of the former is equipped with a reeling device permitting drawing of stainless products over a bar. To cover the range of point sizes required in the cold-drawing operation there are one ¾-inch and one 2-inch rotary swager and one 800-pound hammer.

A complete complement of finishing equipment is available. This includes a 12-roll straightening machine with a capacity up to 2 inches OD, a gag press straightener for 2 to 4½-inch tubing, one two-roll straightener with a capacity up to ¾-inch OD, and one five-roll straightener with a capacity up to 4½ inches OD. There are also two units of two cutoff machines each, complete with conveyors. One has a capacity of 2 inches OD and the other of 6 inches OD. Each unit is equipped with adequate stops to permit accurate cutting to the most exacting dimensions.

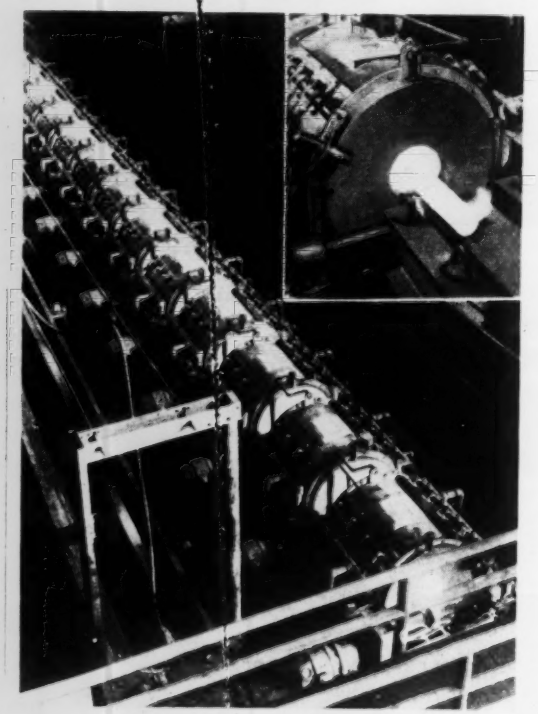


Fig. 5—This battery of 13 reheating furnaces in the No. 2 seamless tube mill heats the tubes before they enter the continuous sizing mill. Reheated tube leaving the line is shown in the inset

Testing equipment consists of a coupon press with plugs, pins and gages to perform the manipulations required of each specification. One hydrostatic tester for tubing up to 4½ inches OD is provided for pressure testing. This equipment can exert pressures up to 3000 psi. Tubing above 4½ inches OD is sent to an adjoining unit where the straightening, cutting and hydrostatic testing is performed.

Crane Installation Facilitates Drainage—Final pickling, or "passivating", is performed in a unit of two pickling tanks and a water rinse. This unit is equipped with an individual crane operated from a floor position at the extreme end of the pickling tanks. The crane has two hooks, each individually controlled. This arrangement permits lifts of tubing to be elevated at various angles, facilitating complete drainage. After a final rinse, the tubing is blown out with live steam and air. There are four internal belt-polishers and additional external polishing equipment to produce surfaces in the grit requirements of the customer.

In addition to frequent spot checks throughout the manufacturing process, the finished product must undergo final inspection. For this purpose two inspection and packing tables are located near the pickling room.

Each Furnace Zone Has Individual Controls—The rotary furnace is designed to incorporate five individual walled zones, each with its own separate furnace controls and equipped to burn oil or gas, or oil and gas in combination. A machine automatically feeds cold rounds as required onto a conveyor. The conveyor, in turn, is automatically activated from the discharge end of the furnace by the manually operated discharging machine.

Two finishing floors handle the full range of seamless products manufactured on both the No. 2 and No. 3 mills. No. 1 floor is located near No. 3 seamless mill and processes both hot-rolled and cold-drawing tubing from 3/16-inch to 3½ inches OD. No. 2 floor is located near No. 2 seamless mill and can handle tubing of 3½ to 9 inches OD. Both floors are equipped with straightening machines of various types, cutoff machines, hydrostatic testers, pipe-coating equipment and tables for inspection and packaging.

Tubing, other than hot-rolled, requiring further treatment, such as pickling, doping, cold-tube reducing, cold-drawing, pointing, normalizing, intermediate and final annealing, is processed in this department. The furnaces are of the continuous roller-hearth type for normalizing and bright annealing and of the convection type for imparting structure and tensile properties.

The cold-working division consists of drawbenches of 20,000 to 300,000-pound capacities and tube reducers handling tubing of 1½ to 3½ inches OD. The 20,000-pound, high-speed multiple drawbench is new. Other changes consist principally of streamlining the handling of material by relocating the necessary equipment.

Three Senses Control Wrenches

THREE SENSES—feeling, sight and sound—control the line of twelve high-speed Proto torque wrenches recently announced. A development of Plomb Tool Co., Los Angeles, the wrenches employ the nerve system and its instantaneous, automatic (involuntary) reflex muscular reactions, this control method reportedly being actually faster than thought.

A trip lever is set at the desired torque reading and when the wrench is pulled to this reading, the lever trips a signal trigger and a strong impulse is imparted to the hand and a loud click is sounded. The operator may also watch a pointer advance along an easy-to-read dial and see when the proper torque is reached.

With the three methods of control available, an operator can work in blind spots, in bad light or in noisy places. Wrenches have capacities from 25 to 300 foot-pounds and from 300 to 3600 inch-pounds.

Contest Promotes Safety

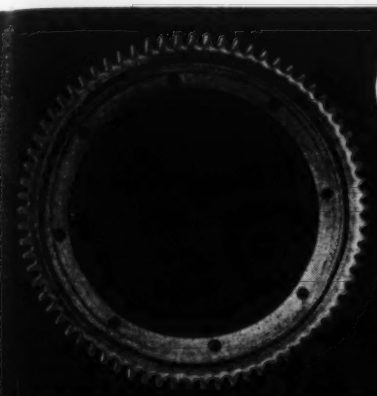
RULES of the American Standards Association will be used to determine lost-time injury rates for more than 150 foundries participating in the 1950 national safety contest, sponsored by Steel Founders' Society of America, Cleveland. Contest will be conducted during the months of June, July and August, a period during which precedent indicates accident frequency rates tend to be high.

Awards will be based on the statistical results of monthly reports filed with the society under the rules and procedures formulated by its national safety committee. For purposes of the competition, the industry members will be divided into four groups based on the number of man-hours of exposure per month as developed from an analysis of lost-time injury reports for the 1949 contest period.

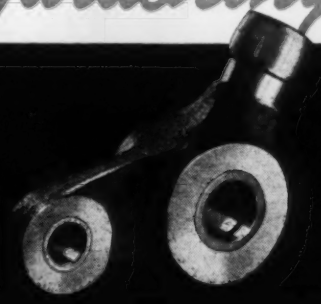
Hydraulic Low-Lift Truck

HIGH pressure hydraulics provide full control in lifting and lowering operations on the 6000 pound low-lift platform truck introduced by Automatic Transportation Co. of Chicago. Of importance in foundry operations where fragile items such as green cores are handled, the hydraulic system has relief valves for overload protection which are said to reduce wear and prolong life of the equipment.

Hardening



Production up from 14 to 35 per hour, and savings of $82,507 per year on this International Harvester gear.

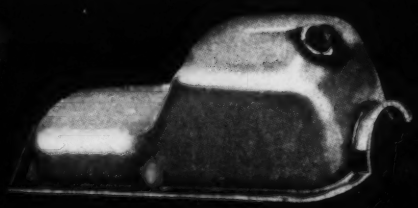


Over 4¢ saved on every part, 600 parts per hour when Lima-Hamilton TOCCO-hardens these shifting levers.

Hardening costs cut 80% by TOCCO-hardening wearing area of Link Belt Company conveyor trolley wheels.

Brazing

Kennametal, Inc. brazes carbide tips on these mining machine bits and hardens shanks at the same time. Output—one every 20 seconds.

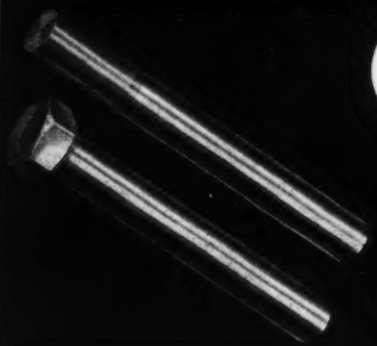


Nash Motors cuts cost 60%, triples hourly output by TOCCO-brazing drain flanges to automotive oil pans.

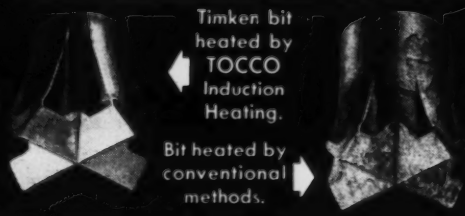
←TOCCO brazed in 15 seconds.

A 6¢ TOCCO-brazing job saves $17.00 tools—saves $2,000 a month at a midwest automotive parts plant.

Forging



H. M. Harper boosts production up to 265% and die life up to 400% by TOCCO-heating non-ferrous bolt blanks for forging.



Timken bit heated by TOCCO Induction Heating.

Bit heated by conventional methods.

Scale was reduced from 2.79% to .79% by applying TOCCO to heating bar stock for forging rock drill bits at Timken Roller Bearing Company.

3⅜" x 7" x 1" Billet

Tractor track link forging.

Forging die life tripled and scale reduced over 99% when Willy's Overland Commercial Forge Plant installed TOCCO Induction Heating for forging.

All These Jobs, And Probably Some of Yours, Can Be Done Faster, Better and at Lower Cost with TOCCO* Induction Heating

THE OHIO CRANKSHAFT COMPANY

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-7, Cleveland 1, Ohio

Please send copy of "TOCCO Induction Heating".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

One of three engine rooms at Alcoa's Point Comfort Works which converts gas into electrical energy. The 40 units in this room service only one pot line. Each is directly coupled to a generator on a lower floor

Natural Gas Supplies Power To Make Aluminum

Low-cost electric power sources at Alcoa's Point Comfort Works increase aluminum production by 114 million pounds

IT TAKES electrical power—lots of it and at low cost to produce aluminum. To make one pound of aluminum 10 kilowatt-hours of electricity are required—enough "juice" to run an average household two days.

When Aluminum Co. of America, late in 1948, began looking around for a new site to expand its aluminum production facilities to meet increased demand for the metal, the big question was: What to do about power?

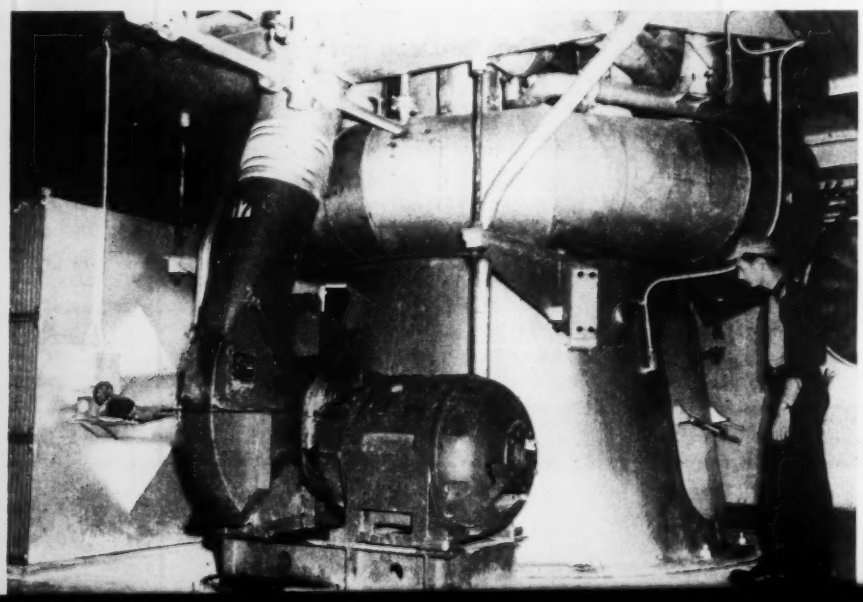
Except for a short period during World War II, and early days of the industry, hydroelectric power was always used for aluminum production in Alcoa plants. But hydroelectric power is not always available where wanted—in this case at Point Comfort, Texas, near the principal source of bauxite in United States, Arkansas.

Since low-cost electric power is an important consideration in making aluminum, it didn't take Alcoa long to supply the answer—natural gas.

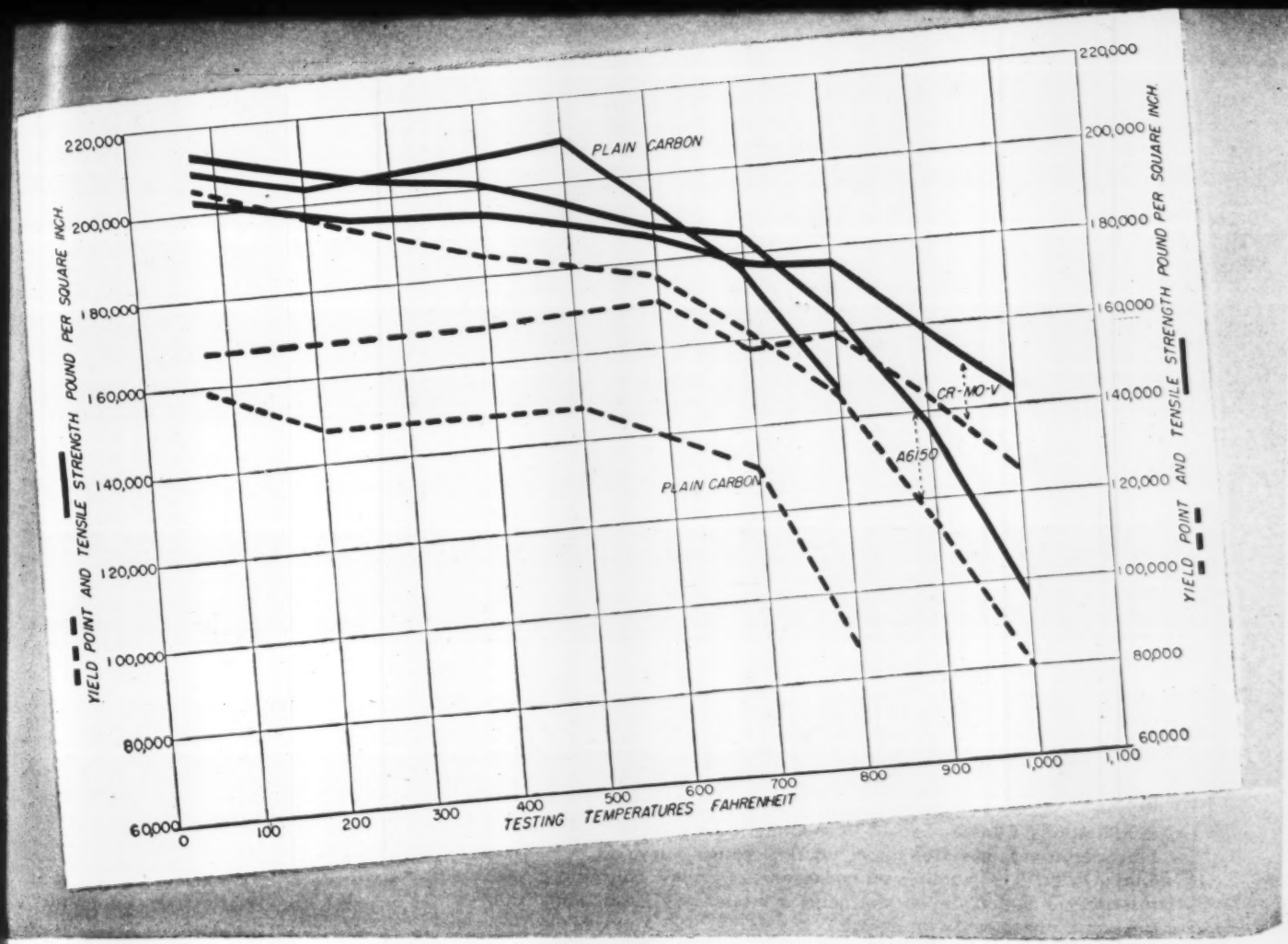
Today, natural gas is being used by the company at its new 3000-acre Point Comfort Works to produce 114 million pounds of aluminum annually by the electrolytic process. What this added poundage will mean to the metalworking industry can readily be seen when you consider that 1949 saw about 1,206,924,000 pounds of aluminum produced.

Two Gas Sources—Normally, the plant uses more than 30 million cubic feet of gas per day—converting it into electric power required to make aluminum. Total output of the power plant, normally, is about 2,750,000 kilowatt-hours per day. The gas comes from both on and off-shore wells, gathered and distributed by Lavaca Pipe Line Co., an Alcoa subsidiary. It is piped to the works located on Matagorda Bay near Port Lavaca, Texas, at a pressure of 400 to 500 pounds per square inch. This is later reduced in two stages to 60 pounds. By the time it arrives to the engines in the three power houses, its pressure is cut to about 6 pounds.

Three Engine Rooms—The Point Comfort Works uses 120 engine-gen-



Closeup of one of the generators housed in a steel engine base. Motor-driven scavenging air blower is in foreground with air and exhaust manifolds above



HIGH TEMPERATURE PROPERTIES

of Cr-V and Cr-Mo-V Spring Steels

SPRINGS FOR SERVICE at elevated temperatures require steels which resist softening and lowering of the yield point. Unless hardness and yield strength are stabilized by correct alloy additions to the steel, these properties deteriorate rapidly as the temperature is raised.

The chart above shows the yield point and tensile strength of three types of spring steel at elevated temperatures determined by standard short-time tension tests.

Springs of plain carbon steel are sometimes used at moderately elevated temperatures, although their lower yield values prevent them from giving service as satisfactory as that of the alloy spring steels.

Chromium-vanadium steel springs, such as AISI 6150, give better service at ordinary temperatures because of the higher yield point. In addition, they may be used at operating temperatures up to about 700° or 750° F because they retain high yield point values as the temperature is increased.

Chromium-molybdenum-vanadium steel was especially designed for springs operating at temperatures in excess of 750° F. It can be used for springs operating at temperatures as high as 850° F or even higher under some conditions. At 800° F, the yield point of this steel is still greater than that of plain carbon steel at room temperature.

If you have a problem in spring applications at elevated temperatures, our metallurgical engineers will be glad to help you solve it.

MAKERS OF ALLOYS — VANCORAM BRAND — CHEMICALS AND METALS

VANADIUM CORPORATION OF AMERICA

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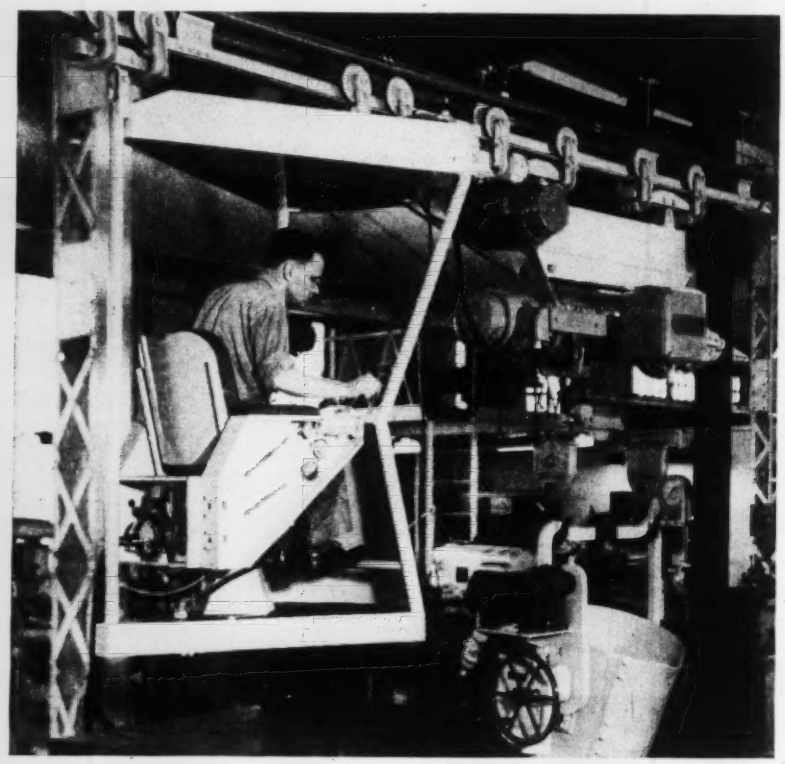


POURING BY CRANE: Seated in a comfortable swivel chair at all times, the operator of the Trambeam pouring system, developed by Whiting Corp., Harvey, Ill., controls all movements of trolley, hoist and ladle from his cab. Mounted on an overhead monorail, the distributing ladle of the unit is operated by an electric cable hoist. Cab provides full vision of the pouring operation. Flexible suspension of track from building structure is said to result in an even distribution of load and smooth travel on both straight and curved track

erator units to convert the gas into electrical energy. Forty of these are housed in each of three engine rooms, one for each pot line. The pot line, consisting of several pot rooms, is where the reduction takes place.

The electric generators themselves are located in the lower level of the power houses, and are joined to the engines by direct coupling. Each engine-generator unit with its auxiliaries, operates independently. Each generator produces 1000 kw direct current at 667 volts and 125 kva alternating current at 425 volts and 24 cycles. This eliminates need for a common auxiliary power system and possibility of a total station interruption.

Operations Easily Observed—Each engine-generator unit has its own control panel which includes engine protective equipment. Besides unit control panels, each powerhouse includes a master control room with recording and indicating equipment registering the operation of each of the 40 engines and generators. No unit can be shut off from this master control room, but it provides a central point from which the operation of 40 units can be observed.

Centrifugal type scavenger air blowers, which provide air under pressure to the engine cylinders, are driven by a 100 horsepower motor. The blowers supply air at the rate of 7000 cubic feet per minute.

Classified Metallurgy

METALLURGICAL information in all printed or recorded forms can be easily and quickly found and accurately classified as to process, properties and materials with a classification outline, recently developed by the American Society for Metals, Cleveland, in co-operation with the Special Libraries Association. It is said that when used with a special punch card system, the classification provides for as many as 181,000 different index headings on metallurgical information.

System is designed to serve both librarians and metallurgists in a variety of ways. For instance, a clipping file or a series of reports, notes, pamphlets and similar material may be placed in logical order by following the subject outline adopted in the classification system. Such information may also be filed under the new method of punch card making it possible to assemble in a short period of time the fullest possible background reference on any of scores of processes, properties or materials.

New system is adapted to the coding and classification of metal literature annotated in the monthly news digest, *Metals Review*, published by the society. Annotations of metallurgical literature will be segregated into 19 main subject headings with symbols at the end of each abstract as reference guides to the system's operation; the February, 1950, issue is the first so marked. The punch card method adopted is a hand operated system which is said to require no elaborate or expensive equipment.

Navy To Use Sendzimir Mill

GOVERNMENT metallurgists are looking forward with interest to see what the Navy will do with a new rolling mill intended for the production of extremely thin sheet. It is a laboratory-size Sendzimir mill built by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., under patents of the Armzen Corp., Waterbury, for installation in the new magnetic materials building—at the Naval Ordnance Laboratory, White Oak, Md., to be completed later this year.

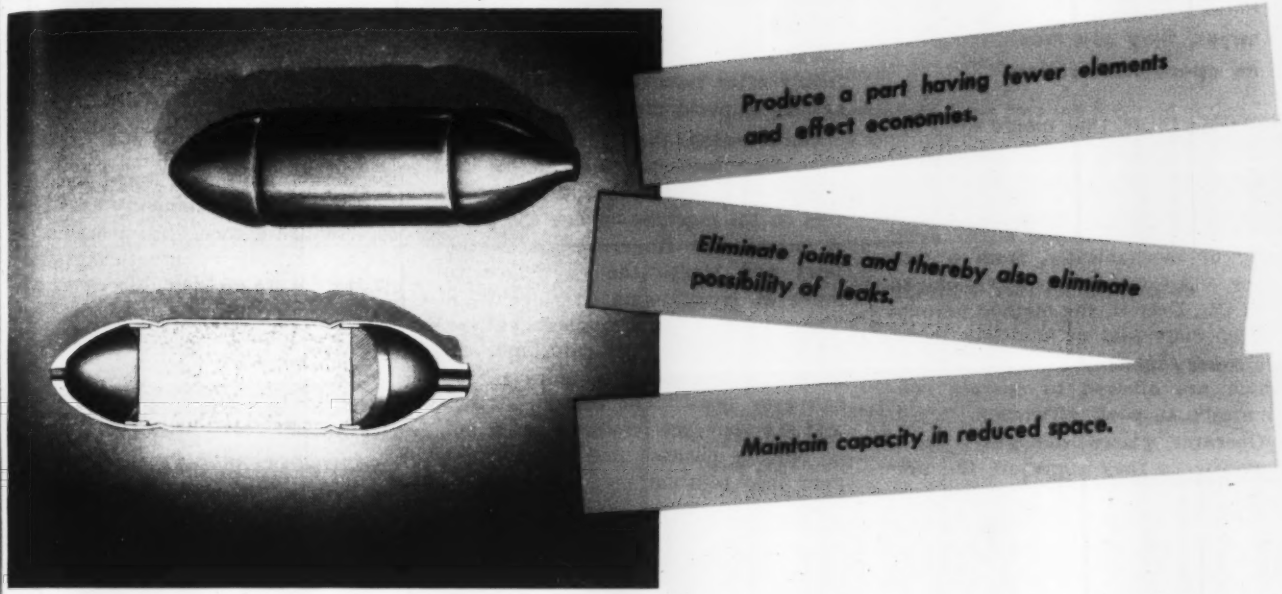
What the Navy hopes to derive from the Sendzimir mill is production at a rate of 100 to 200 pounds of thin strip per 8-hour day which it is now producing at the rate of about 5 pounds in 8 hours on a miniature Rohn mill which it brought from Germany after the war. In the Rohn mill strip up to 2½ inches wide is rolled to thicknesses as minute as 0.00025-inch, and even to 0.000125 when the material is copper-plated, with the copper removed after rolling.

Material rolled is of nickel-iron composition. The product is a magnetic strip material for use in magnetic amplifiers and other magnetic devices. Defense requirements for such material have been increasing rapidly.

For steel men working with much larger units, details of this laboratory equipment are of interest. The cold-roll Sendzimir mill has two work rolls 0.468-inch in diameter, with backup rolls—two above and two below the work rolls—0.937-inch in diameter; all are 10¼ inches across the face, thus being capable of rolling strip up to 8½ inches wide. The Rohn unit, a 20-roll cluster affair,

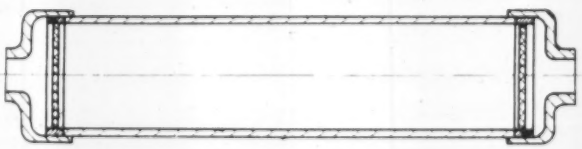
This can happen to you

Changes can be made in some functional component of a complete operating unit you are making that can mean economies and sales benefits . . . . Taking a case out of our files—here's a manufacturer, drawing on our extensive background, made a change in design and production of a dryer that brought about worthwhile advantages . . . . The development enabled him to . . . .


Produce a part having fewer elements and effect economies.
Eliminate joints and thereby also eliminate possibility of leaks.
Maintain capacity in reduced space.

The photo shows the streamlined, efficient part as it is now produced. Reference to the diagrams makes the advantage obvious.

OLD WAY:



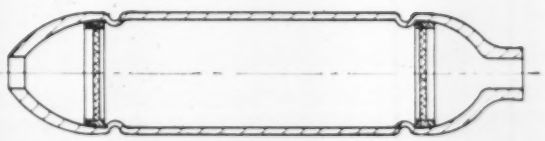
Material:

1. Seamless copper tube
2. End caps
3. Screen retainer units
4. Silica gel charge

Operations:

1. Assemble screen retainer and cap to one end
2. Fill with silica gel charge
3. Assemble screen retainer and cap to other end
4. Braze

NEW WAY:



Material:

1. Seamless copper tube
2. Screen retainer units
3. Silica gel charge

Operations:

1. Bead both ends of tube for screen retainer units.
2. Fill with silica gel charge and assemble screen retainer.
3. Spin both ends closed.

Perhaps you are producing a part that *can* and *should* be redesigned to effect savings in cost and materials and ultimately give higher efficiency in operation. Would you like to have one of our engineers discuss these possibilities with you? No obligation, of course. Your letterhead will bring you a copy of our new brochure on our spun end process. Send for it; no charge.

WOLVERINE TUBE DIVISION
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has interchangeable work rolls ranging from 0.160 to 0.3125-inch in diameter, with the backup rolls 0.5512, 0.9449 and 1.5748-inch in diameter (the inch dimensions represent conversions from millimeters); these rolls are 3⅛ inches long. Both mills are motor-driven.

Touch Not These Gears!

After placing gears on a conveyor, they are machined with no operator attention

AUTOMATION, that magic word applied to the use of automaticity in handling of materials, now allows gears to be finished automatically without removing them, either manually or mechanically, from a conveyor. As developed by Michigan Tool Co., Detroit, the method permits use of individual or multiple model 870 rotary gear finishing machines which are allowed to operate continuously at peak efficiency.

Operator places the gears on a conveyor as they come off the previous operation. They are then carried through the finishing operation and returned to the operator for removal from the conveyor. Making this arrangement possible was the act of passing the conveyor through the machine, instead of passing by the machine in its conventional manner and having an operator load the machine.

Machines in Battery—On the same conveyor cluster gears can pass through a battery of the machines, each of which in turn finishes a specific gear in the cluster. Conveyor itself provides the automatic transfer from one machine to the next. Spring loaded jaws on the conveyor hold the gears.

To hang a gear on the conveyor, light finger pressure on the top of the jaws opens them and the gear is inserted. The pressure released closes the jaws. Finished gears are removed in the same manner, although automatic release from the conveyor is possible if provision is made to handle the gears automatically after removal in such a manner as to avoid nicking.

Once loaded, the conveyor carries the gear into position above the finishing cutter. Air-operated centers on the machine engage the gear. A mechancial finger separates the jaws and leaves the gear free to move at crossed-axis on the cutter. The machine goes through its cutting cycle and the mechanical finger releases to re-engage the gear in the conveyor jaws. The centers retract and the conveyor moves the gear out of cutting position and to the next gear into position.

Requires 2½ Seconds — Indexing, engagement by centers and release of jaws takes a total time of 2½ seconds. As an example, a 14 pitch, 2⅝-inch diameter, ⅞-inch face width gear is said to require only 17½ seconds to finish, or a total floor-to-floor time of 20 seconds.

All movements of machine and conveyor are electrically interlocked and automatically sequenced. Should a conveyor not index to the correct position or centers not engage the gear properly or jaws not release, the cycle is interrupted. As the conveyor itself controls machine operation, the usual electrical controls on the front of the machine are eliminated. Such pushbuttons as required are located at the loading and unloading station for the conveyor.

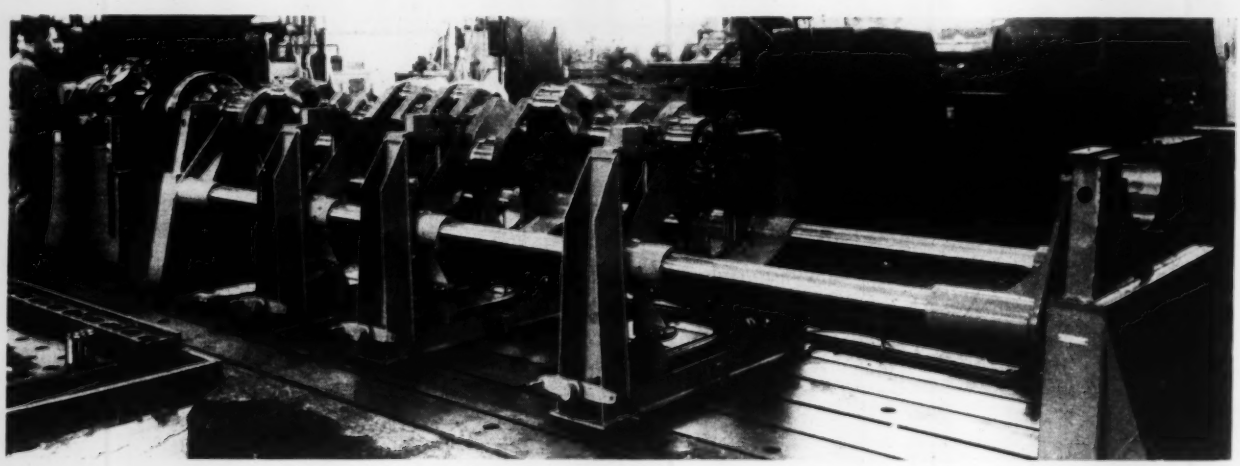
Gear Manufacturing Methods

MANY of the questions that frequently perplex the designer, the manufacturer and the user of gears are answered in the third edition of *Modern Methods of Gear Manufacture*, published by National Broach & Machine Co., Detroit. In the introduction, to the 172-page book, it is stated that the company has "tried to establish a successful procedure in the art of gear manufacturing as far as the nature of the subject will permit." It contains 170 photographs and drawings, plus numerous tables and graphs.

Aluminum Clothed in Hard Coat

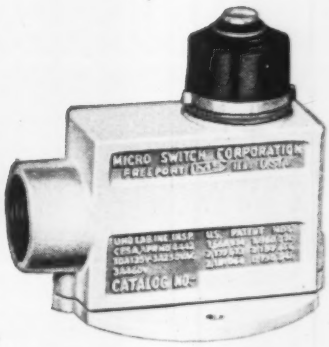
OPENING a way for industry to take fuller advantage of the lightweight attribute of aluminum is a new hard coating for the material. According to Glenn L. Martin Co., Baltimore, it has been necessary to resort to other metals for all structures requiring high wear-resistance. Standard tests performed on a Taber abrasion tester have shown the new coating to possess considerable resistance to wear.

The coating is applied to aluminum and alloys by an electrochemical process which creates a nonmetallic



PRACTICALLY PERFECT BALANCE: Amount and location of the dynamic unbalance of this 4790-pound crankshaft is measured to an accuracy of 1 pound-inch by the type 6-UH balancing machine shown in the photograph. Built by Gisholt Machine Co., Madison, Wis., for Baldwin Locomotive Works, Eddystone, Pa., the Dynetric machine is being used for balancing the crankshaft for an 8-cylinder supercharged diesel engine. Unbalance is equal to a measurable displacement of 0.0002-inch at either end of the cradle

MICRO PRECISION SWITCHES for Production Short Cuts



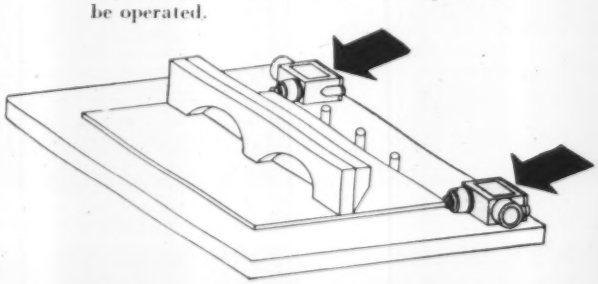
MICRO . . . First name in precision switches

Plant electricians and factory maintenance men are continually finding new ways to use MICRO precision switches to reduce accidents to personnel and equipment, eliminate waste of materials, increase accuracy of fabrication, save man-hours and increase production.

The typical plant applications shown here are the "real McCoy." They are production short cuts that have proved themselves in actual operation. Would you like to receive "MICRO TIPS" which contains still other practical applications? Write us today.

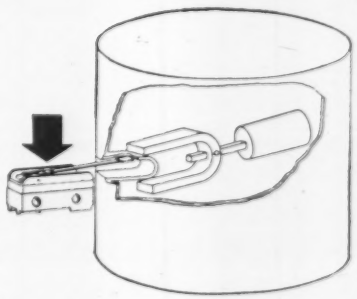
1 MICRO Precision Switches Properly Position Sheet Stock in Shearing Press

Two MICRO precision switches at each end of shear gage bar are wired in series to solenoid-operated safety under the shear pedal. Stock must enter shear evenly, with both ends depressing the switches, before the pedal can be operated.



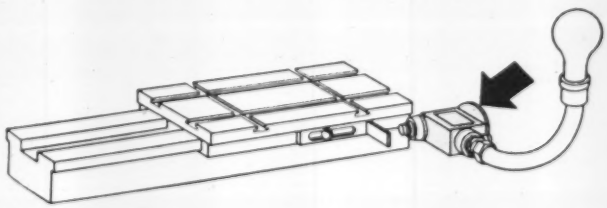
2 MICRO Precision Switch Operates Controls for High Pressure Hydraulic System.

Variations in level of the float alters position of magnet which operates switch with minimum amount of travel and has no spring return. This provides water-level control without mechanical linkage. Switches are used to indicate high water, sound an alarm, shut off pumping system and actuate an annunciator drop.



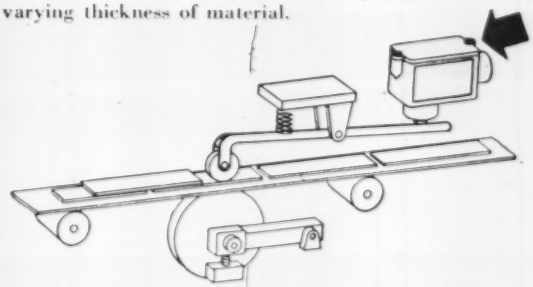
3 MICRO Precision Switch Stops Hobbing Machine and Operates Signal Lamp.

Switch, mounted on hobbing machine, is actuated by a piece of metal mounted on the carriage. When the cut is finished, the metal strip actuates the switch which stops the machine and closes a circuit to a red signal lamp.



4 MICRO Precision Switch Checks Parts for Double Thickness.

Switch is mounted on conveyor feeding steel parts to signal operator and stop the conveyor should there be a double thickness of parts on the conveyor. The mechanism is made adjustable to varying thickness of material.



MICRO SWITCH Distributors with complete stocks are located in ninety-nine cities to supply you with just the right switch to make your plant operations more automatic. Look for them under "Switches, Electric" in your classified phone book.

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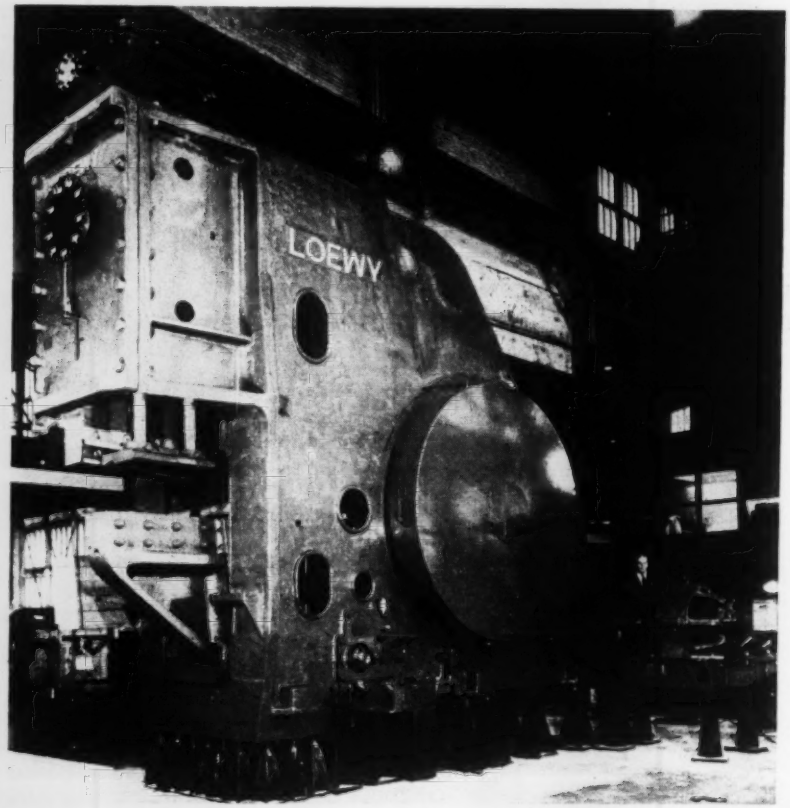


SLAB SLICER: This giant 1150-ton capacity up-cut shear will soon be cutting hot steel blooms 16 x 16 inches and slabs 40 x 6½ inches in a modern 44-inch European blooming mill. Designed by Loewy Construction Co. Inc., rolling mill division of Hydropress Inc., New York, the unit features a system of forged and cast members which absorb cutting pressure so that no strain is taken up by the shear housing. Upper blade is adjustable vertically through an electric motor in accordance with thickness of sections to be cut

highly heat-refractive surface, strongly bonded to the base metal. Coating thicknesses are said to range from 0.0001 to 0.006-inch, with abrasion-resistant uses calling for a thickness of 0.002-inch as a rule. It is reported that surface smoothness in general is closely maintained by the processing and that the coating hardness may be considered as "file hard".

Designated as MHC finish, the coating is being used on a variety of units from pistons, cylinders and jack-screws, which would seize if uncoated, to airplane door thresholds and mechanic's wrenches.

Test Service Offered

SPECIALIZING in actual weathering and sunlight tests, corrosion, mildew, rot and general deterioration in connection with protective coatings, building materials, fabrics, packaging, mechanical and electrical equipment, etc., is the South Florida Test Service, Miami, Fla. It maintains several testing locations for various types of tests, including salt atmospheric, tidewater, total immersion, storage and complete instrumentation for measuring and recording solar radiation, etc. Organization is also available for research and engineering in connection with the development of new materials and products and for special experimental work and consultation.

Welding Saves the Day

WHEN the base for a 1100 ton press breaks, you don't just go to the stockroom and draw out a replacement. You have the choice of ordering a new base from a foundry or fabricating a base in your own shop.

Such was the predicament of Henry Vogt Machine Co., Louisville, Ky., when its press base split in two while squaring the ends of sectional headers. This giant hydraulic press, was purchased in 1916, and today is still one of the largest pieces of equipment of this type in its section of the country.

The company, using its experience in the fabrication of boilers, heat transfer, oil refining and similar equipment, decided to expedite repair of the press by fabricating the base in its shop. Using the Unionmelt welding process of Linde Air Products Co., New York, it was thought that the press could be put back into operation considerably in advance of a time when a replacement could be obtained.

The finished base, measuring 13 feet long, 7 feet 7 inches wide and 3 feet 10 inches high, was fabricated and the press put back into operation 3 months earlier than would have been possible had a new base been ordered from a foundry. Bottom and side plates are made of 3-inch and 2½-inch thick steel, respectively, and the top plate of 5-inch steel plate.

All parts for the 10-ton box were oxygen-cut to size from firebox quality, 70,000 pound tensile strength steel, and welded into place with a Unionmelt UE-37 welding machine.

Hardens in Water and Oil

ENTIRE range of ground flat stock available from Brown & Sharpe Mfg. Co., Providence, R. I., is reported to be available for hardening in oil as well as in water. All sizes 3/16-inch and under in thickness may be hardened in either oil or water, thereby simplifying stocking and reducing inventories.

Thicknesses from 7/32 to 1 inch are available for hardening in oil only or in water only. Sixteen thicknesses in widths up to 6 inches, all 18 inches long, are available in the water and oil hardening variety. All pieces have smooth edges and are marked as to type at intervals throughout their entire length.

Bearing Booklet

SELF-LUBRICATING Ledaloyl bearings are the subject of catalog L-5, offered by Johnson Bronze Co., New Castle, Pa. Ledaloyl is a powder metallurgical product combining copper, tin, graphite and lead in the form of prealloyed bearing bronze. Catalog includes specifications, alterations, methods of installation and prices.

NEMA Accounting Manual

CLASSIFICATION and definition of accounts and accounting for plant and equipment plus a comprehensive treatment of cost accounting and analysis of cost variances are included in the seventh edition of the uniform accounting manual for the electrical manufacturing indus-

try, available from the statistical department, National Electric Manufacturers Association, 155 E. 44th St., New York 17, N. Y.

Subject matter is arranged in such a manner as to be useful to companies of all types ranging from the small to the very large company, the single product line to the multi-product line company and from companies with limited accounting staffs to those with large departments. It may be obtained from the association for $12.50.

Wheels Act as Bearings

BALL bearing wheels are employed as end bearings for rollers on a new line of conveyors designed by Sage Equipment Co., Buffalo, N. Y. Wheels are pressed into each end of 2-inch diameter rollers which ride on ¼-inch cold rolled steel shafts. Side frames, of welded steel construction, are made of 2 x 1 x ⅛-inch channel.

Conveyors are offered in 5 and 10 foot straight sections and 45 and 90 degree curves. Curves have inside radius of 34 inches. Available widths are 12 and 18 inches with rollers on 3, 6, 9 and 12-inch centers. These conveyors may be used in combination with gravity wheel conveyors, ball transfers, etc., made by the company.

CALENDAR OF MEETINGS

† *Denotes first listing in this column*

July 12-14, American Society of Civil Engineers: Summer convention, Toronto, Ont. Society headquarters are at 33 W. 39th St., New York.

July 12-14, American Home Laundry Manufacturers' Association: Meeting, Atlantic City, N. J.

July 28, Malleable Founders' Society: Western sectional meeting, Drake Hotel, Chicago. Society headquarters are in the Union Commerce Bldg., Cleveland.

Aug. 7-19, First U. S.-International Trade Fair: Coliseum, International Amphitheater and Navy Pier, Chicago. Fair headquarters are in Congress Hotel, Chicago.

Aug. 14-16, Society of Automotive Engineers: West coast meeting, Biltmore Hotel, Los Angeles. Society headquarters: 29 W. 39th St., New York 18.

Aug. 16-18, Third Western Packaging and Materials Handling Exposition: Civic Auditorium, San Francisco. Additional information from Clapp & Poliak Inc., 341 Madison Ave., New York 17.

Sept. 5-9, American Chemical Society: National Chemical Exposition, Chicago Coliseum. Sponsored by Chicago Section, ACS, 86 E. Randolph St., Chicago 1.

† **Sept. 11, Society of Automotive Engineers:** Tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

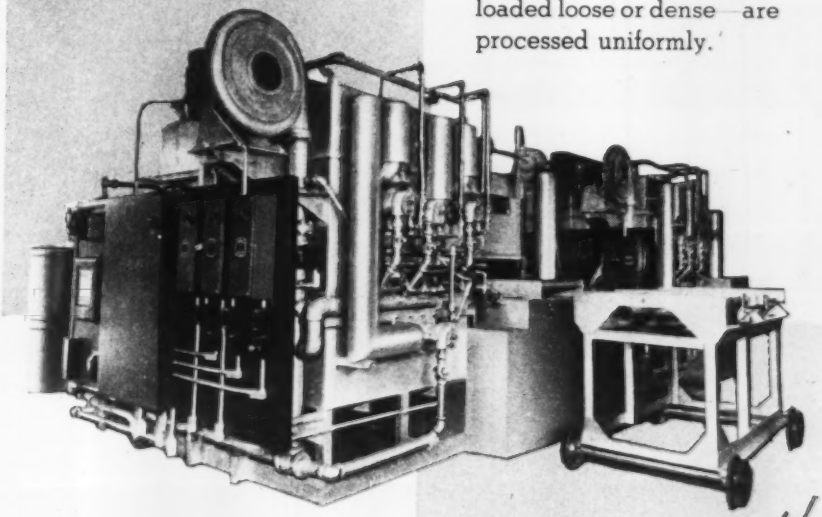
† **Sept. 11, Society of Automotive Engineers:** Aeronautic meeting and aircraft engineering display, in Los Angeles. Society headquarters are at 29 W. 39th St., New York.

† **Sept. 13-15, Porcelain Enamel Institute:** Twelfth Annual Forum, University of Illinois, Urbana, Ill. Institute is located at 1010 Vermont Ave. NW, Washington 5, D. C.

...BLAZING THE HEAT-TREAT TRAIL... ©

New Production-line Holcroft batch-type furnace

This compact heat-treat furnace has a vestibule, heating chamber, quenching tank—all above floor level and in one unit.



does more jobs...

You'll be able to handle a wide variety of jobs at temperatures ranging from 400° to 1700° F., and get clean, scale-free work. All contamination is removed by a high flow of generator gas in the vestibule. The furnace fan circulates atmosphere so that parts—loaded loose or dense—are processed uniformly.

faster...

The furnace can be operated automatically, or manually, by push-button controls. To save time, the temperature is built up between cycles to a point higher than necessary; then the normal operating temperature control is resumed after the cool parts enter the furnace. The quench tank handles the full load in one operation.

at a lower cost!

The furnace requires minimum floor space, no pit for the quenching tank. It can be moved easily—as a unit—to any part of the production line. Trays last longer because they are carried—*not* pushed or pulled while hot.

Want more information? Write us today!

SINCE 1916 Holcroft AND COMPANY

BUILT BY HOLCROFT & COMPANY DETROIT-MICH

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

CHICAGO 9 — C. H. Martin, A. A. Engelhardt, 4209 South Western Blvd.
CLEVELAND 2 — Wallace F. Schott, 6516 Detroit St.
HOUSTON 1 — R. E. McArdle, 5724 Navigation Blvd.
CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

If it's made of iron or steel, and exposed to the elements, remember to have it Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company
pittsburgh...pennsylvania

the world's largest job galvanizing plant

in the heart of the STEEL INDUSTRY

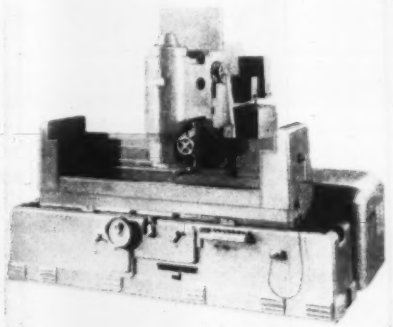
HOT-DIP GALVANIZING

galvanizing....pickling....painting....oiling

New Products and Equipment

Reciprocating Table Grinders

Range of sizes in widths and lengths are offered in the line of vertical spindle fixed column surface grinders with reciprocating tables, made by Thompson Grinder Co., Springfield, O. Wheel head has a built-in motor construction. Heavy spindle is mounted on preloaded ball bearings for radial load and spring loaded ball bearings for thrust load. A horsepower meter indicates grinding wheel load. Vertical rapid traverse of wheel head is furnished with single lever control which declutches elevating handwheel. Automatic downfeed is supplied to the wheel head.



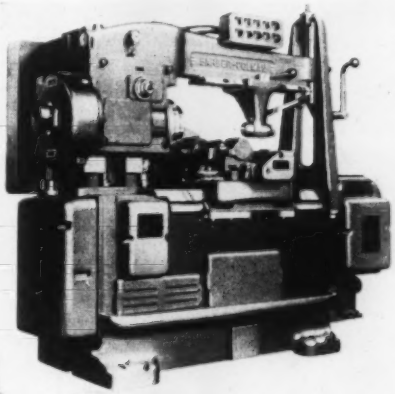
Wheel truing device is mounted rigidly on the wheel head. Extra clamping space is provided at each end of the table work surface, which can be positioned clear of the wheel at either end of the stroke. All bearing surfaces are fully protected at all times. Hydraulic power unit is housed in a separate steel tank with large oil reservoir. When power rapid traverse is used, overtravel to the wheel head is prevented by a limit switch. Magnetic chucks and magnetic coolant separators may be used.

Check No. 1 on Reply Card for more Details

Improved Hobbing Machine

Providing closer control over finish and accuracy and increasing output and flexibility is the model No. 16-16 gear hobbing machine announced by Barber-Colman Co., 1309 Rock St., Rockford, Ill. Available as extra equipment is an automatic hob shifter of the mechanical type, electrically actuated to shift in increments as small as 0.0026-inch. It moves forward or reverse by changing a selector lever and automatically resets the hob in a new cutting position after each machine cycle.

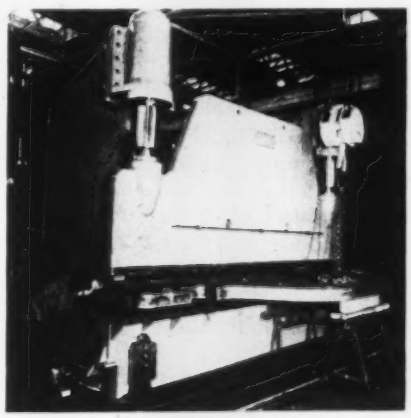
Redesigned hob slide is made to keep chips from lodging between gibs and ways of hob slide and hob swivel. Hob spindle has a standard milling machine taper to prevent damaging the hob spindle bearing by drawing up the hob arbor too tightly. Machine has one flat and one V-way for greater accuracy and rigidity. An electrically actuated jaw clutch is used to engage the feed selector. Preset stops on the feed control selector are actuated by limit switches. All feed, index and differential change gears are identical in design, making necessary only one full set of gears for universal operation.



Check No. 2 on Reply Card for more Details

Press Brakes Are Hydraulic

Verson Allsteel Press Co., 9318 S. Kenwood Ave., Chicago 19, Ill., is producing a line of hydraulic press brakes which offer advantages of hydraulic operation to heavy plate work. Presses are suited for straightening and forming to templates where the forming requires repeated strokes.



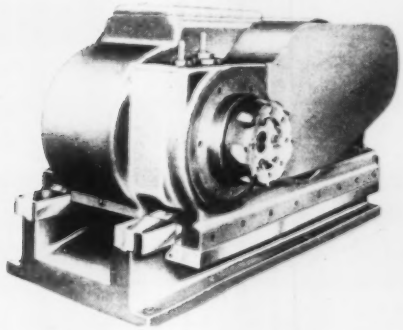
As they cannot be overloaded, presses may be used for bottoming work. Ability to deliver any predetermined tonnage up to capacity, availability of entire rated tonnage at any point during the stroke and ability to use all or any portion of the stroke, are other advantages.

Check No. 3 on Reply Card for more Details

Adjustable Quill Milling Head

Head for production milling manufactured by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, O., has all gears integral or mounted solidly by taper and key to lock them in place on the shafts. Steel quill is adjustable up to 2 inches for cutter wear, movement being gaged by a micrometer dial.

Flywheel effect is obtained by a large, heavy spindle gear mounted solidly on the spindle. A geared pump provides bearing and gear lubrication inside the head. Hardened steel ways are automatically lubricated. Although arranged for single speed production work using either high speed steel or tungsten carbide-tipped cutters, change gears can be provided.



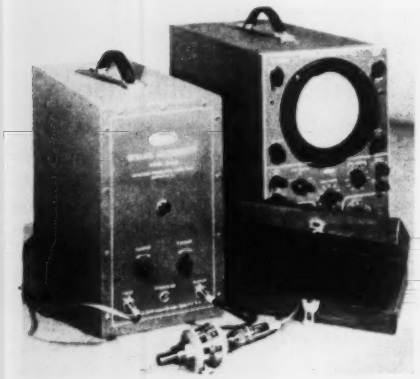
Check No. 4 on Reply Card for more Details

Measures Vibration, Movement

Dynamic or static displacement due to eccentricity, axial vibration, radial whip, bearing clearance, reciprocating movement and radial expansion with acceleration may be measured with the dynamic micrometer made by Electro Products Laboratories Inc., 4501 N. Ravenswood Ave., Chicago 40, Ill. Equipment consists of a conventional mechanical micrometer head with sensing unit and an electronic cabinet used with a cathode-ray oscillograph. Direct reading from micrometer head of sensing unit makes calibration of electronic components unnecessary. Calibrations in divisions of 1/10,000 inch are provided.

Oscillograph will show a displacement versus time curve on the screen. All measurements are made without any physical contact between sensing unit and metal body. Measure-

ments are independent of acceleration or frequency of the displacement. Unit will accurately measure amplitude of dynamic movement at

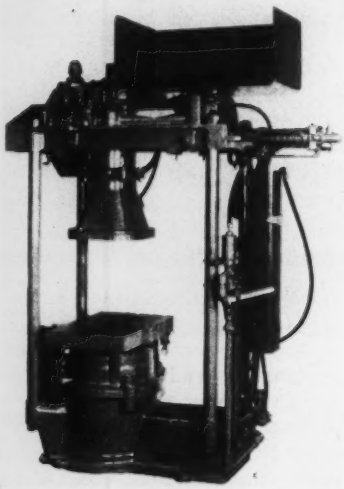


any speed to distances as small as 0.0001-inch. Sensitivity is equal to 1 per cent of total displacement.

Check No. 5 on Reply Card for more Details

Core Blower Becomes Automatic

Operating cycle of clamping the core box, blowing and drawing the core, and refilling the sand reservoir is automatically performed with only one manual control lever on the core blower built by Osborn Mfg. Co., Cleveland, O. The cycle is auto-



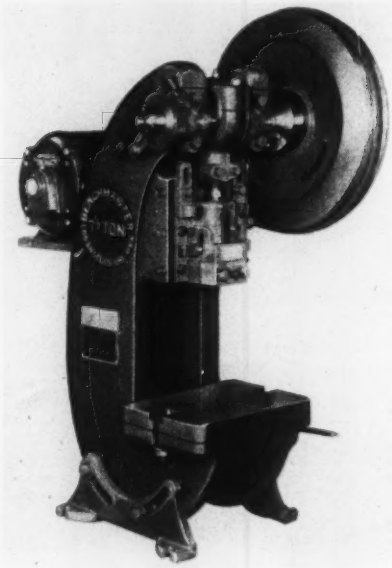
matically terminated after each core is blown. Control which makes this possible may be used on either diaphragm or draw type Osborn core blowers.

For the diaphragm type machine, the average cycle is about 4 seconds and blowing can be adjusted. On draw type machines, the cycle varies from 8 to 12 seconds, depending upon length of draw required for the core. Blowing time and vertical clamping pressures are adjustable. Controls are self-contained and control valves are mounted on a panel on right rear rod of the machine.

Check No. 6 on Reply Card for more Details

Oversized Die Capacity

To cover the widest possible range of press uses, shut height of the 7½ ton punch press, offered by Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles, Calif., has been increased to 9 inches. This oversized die capacity does not hamper use of standard size die sets. Besides making possible use of complex dies of semi or full-automatic types, the



extra capacity aids adaptations of roll and hopper type feeding devices. Ram is equipped with a 1 9/16-inch diameter shank hole. Variety of stroke lengths may be secured for using the press on out of the ordinary jobs. Standard stroke is 1¼ inches, but special strokes up to 2½ inches are available.

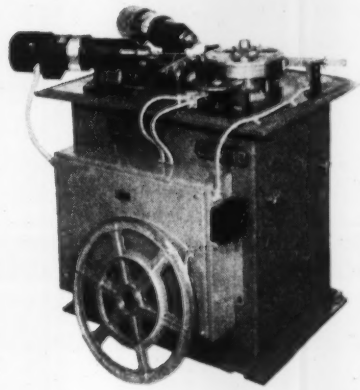
Extra long slides on the ram insure accurate strokes. Both ram slides and ball joint are simultaneously lubricated by a one-shot system. Bolster plate measures 8 x 11 inches. Bed is equipped with a 4 x 5 rectangular opening for bottom ejection. Press is capable of 200 strokes per minute.

Check No. 7 on Reply Card for more Details

Driller and Tapper Combined

Capable of drilling and tapping radial holes in such parts as shown in the photograph is a semiautomatic machine announced by Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich. Machine has one drilling and one tapping unit. As operator hand-indexes the part, the drilling unit begins operation; when the first hole drilled is in tapping position, this second unit operates. From this point on the drilling and tapping units operate simultaneously.

When all holes have been drilled,



the drilling unit stops but the tapping unit continues until all have been tapped. In hand-indexing the machine is interlocked so that the operator cannot index the part until both spindles are out of the work. Units may be positioned according to the character of the part and the number and spacing of the holes to be drilled and tapped.

Check No. 8 on Reply Card for more Details

Compact Wet Blaster

Accuracy of stock removal, uniformity of surface finish, flexibility and speed are advantages claimed for wet blasting as performed by the Cro-Hone machine, developed by Cro-

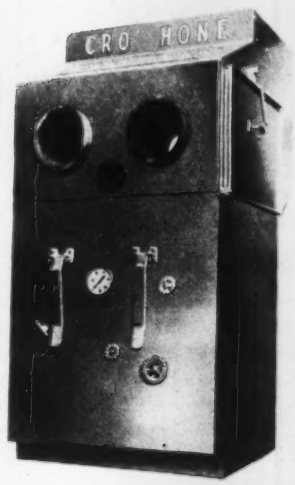


Plate Co. Inc., Hartford 5, Conn. A fine abrasive suspended in a liquid slurry is forced against the work by air pressure. All metal parts coming in contact with the liquid are stainless steel or brass, eliminating corrosion and slurry contamination. Siphon jet guns and air agitators have no mov-

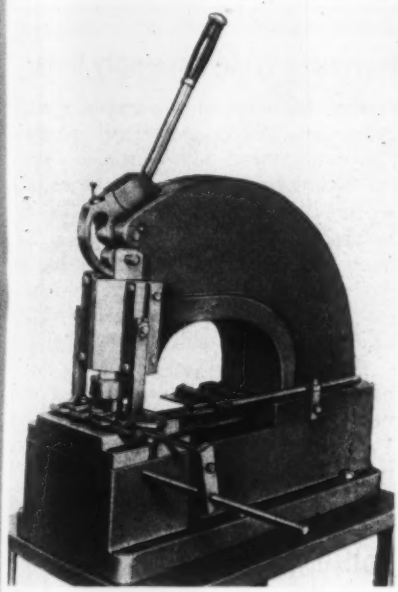
ing parts. Two splash-proof work loading doors on the side enable the standard 30 x 30-inch cabinet to handle large or heavy work.

All valves and controls are located at the front of the cabinet. A large window assures good visibility. A blower of 600 cfm capacity assures good vision by removing abrasive vapors at the work table level. Filter is of the drawer type and is removable for washing. Adequate lighting is assured by two-position illumination.

Check No. 9 on Reply Card for more Details

Deeper Throat Punch

The 12¼-inch throat of the Di-Acro No. 2 punch, made by O'Neil-Irwin Mfg. Co., 304 Eighth Ave., Lake City, Minn., allows working to the center of a 24½-inch sheet. Besides being



able to perforate holes of various shapes and sizes as large as 4 inches in diameter, the punch may also be used for blanking, drawing, embossing and forming. Unit may be mounted on a stand or bench.

A hardened and ground triangular-shaped ram which will not twist or turn assures alignment of punch head. The variety of interchangeable punches in round, square, oval and rectangular shapes is available. Bed measures 6 x 7½ inches.

Check No. 10 on Reply Card for more Details

Heavy Duty Engine Lathe

Swing capacity of 30½ inches, 32 spindle speeds from 5 to 602 rpm and four-directional power rapid traverse are features of the 25-inch heavy duty engine lathe, announced by R. K. LeBlond Machine Tool Co., Cin-

Spur Gears
by Horsburgh & Scott

● Spur Gears by Horsburgh & Scott are "steel muscled" with rims, arms and hubs extra heavy for the pitch. Unless otherwise specified, steel gears are made from .40 carbon steel which has a higher tensile strength and wears much longer than the commonly used .15-.20 carbon steel. These and many other features make H & S gears stand the "gaff" under heavy load conditions . . . giving long and uninterrupted service.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

cinnati 8, O. Gears not actually in use are cut out of the train, thus leaving more of the main drive horsepower free for machining. Machine is arranged for 25, 30 or 40 hp, 1200 rpm main drive motor as required.

Sixteen speeds from 10 to 602 or 5 to 302 rpm are available in the headstock in place of the 32-speed

model. Totally enclosed quick change box, hardened and ground steel bed ways and automatic lubrication throughout headstock, quick change box and apron are incorporated. An electric motor in the apron actuates cross and length traverse. Tailstock may be moved by the rapid traverse motor. Forty-eight feeds and threads may be selected.

Check No. 11 on Reply Card for more Details

Speeds Drum Handling

Towmotor Corp., Cleveland, O., has developed hydraulic forks for its industrial trucks which handle the drums without pallets. The right-hand fork can be moved laterally by

a double-acting hydraulic cylinder, while the left hand fork is anchored in a stationary position.

To pick up two steel drums, the movable fork is first shifted outward; then the truck approaches the drums, allowing the forks to pass to either side and below the upper rolling rings of the drums. Concave notches on the inside edges of the forks make close contact with the sides of the drums when the movable fork is closed. Drums are then picked up between the forks and supported by the rolling rings. For other type pallet loads, forks are used in the normal manner.

Check No. 12 on Reply Card for more Details

Welders without Moving Parts

An electrically adjustable reactor that sets welding current on transformer type alternating current arc welders with no moving parts is available from Hobart Brothers Co., Troy, O. Model TSP-205-C with power factor correction is rated at 200 amp at 30 v. Model TSP-182-C with power factor correction and limited input

for operation on REA lines is rated 180 amp at 25 v. Control of five main taps of welding current from low to maximum is by an easy-to-move hand wheel switch mounted on the front panel.

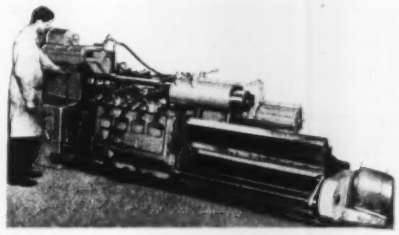
Rheostat control knob controls amount of direct current flowing into reactor to give 100 fine welding current settings in each of five main steps or ranges. Besides adjusting the welding current by changing relationship between direct current flux and alternating current flux in the reactor core, rectified current regulates this relationship at the time the arc is struck to provide a higher than normal current at the arc for a fraction of a second.

Check No. 13 on Reply Card for more Details

Lathe Has Large Capacity

Front turning carriage which may be equipped with two or more individually-controlled, power-operated cross slides for feeding tools into the cut feature the model LS semi-automatic Lo-Swing lathe, made by Seneca Falls Machine Co., Seneca Falls, N. Y. Tool cutting pressures are taken on large rolls, fitted to the bottom of each slide, which remains in constant contact with the cross feed cam.

Other features include cam feed back-squaring attachments operating on an automatic cycle with push button control, an adjustable stop for positioning the carriage in relation to



the starting point of the cut and automatic tool relief at the end of the cut. Lathe is designed to use sintered carbide tools; it has a large cutting capacity at high cutting speeds and coarse feeds.

Check No. 14 on Reply Card for more Details

Increases Weld Assembly Rate

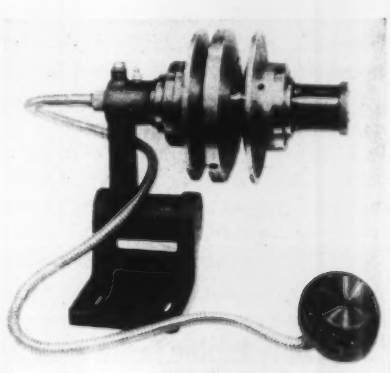
Supplied with motor-driven geneva indexing table, electrical controls and automatic air-operated "pick-off" work ejector is a resistance projection welder offered by Taylor-Winfield Corp., Warren, O. The dual ram type welder, which has no current carrying bearings, has five stations and ten dies for welding two assemblies simultaneously.

Machine will projection weld a mounting plate of 16-gage low carbon steel to 18-gage low carbon steel. Production is at the rate of approximately 1600 assemblies per hour.

Check No. 15 on Reply Card for more Details

Pulley Speed Variable

Adjust-O-Matic pulleys, made by American Type Founders, 200 Elmora Ave., Elizabeth B, N. J., provide



stepless speed control in the range of 3 to 1. Units are equipped with steel-faced sheaves and are designed for drives of ¾ to 1 hp. An aluminum alloy model delivers 2 to 1

range on drives of 1, 1½ and 2 hp. Positive sheave location minimizes ratio slip under varying or cyclic loads. Spacing between sheaves is set by mechanical control which firmly holds the spacing regardless of belt wear, belt pull or belt stretch. Unit may be mounted in any position without causing undue belt wear. Because of light weight, there is no vibration at high speeds. Bearings are sealed for life and speed-adjusting parts are lubricated by a single Alemite fitting.

Check No. 16 on Reply Card for more Details

Checks Internal Groove

Accurate measurement of internal groove diameters and recesses used for precision retaining rings of the Truarc type, ordinary snap rings, O-rings, oil and washer grooves, etc., is possible with the self-positioning Nilco dial groove gage, built by Nilsson Gage Co. Inc., Poughkeepsie, N. Y. Nose of gage has two extensions, the lower having a fixed gaging insert.

One extension is pulled in by a trigger when inserting the nose into a housing. Upon release, this extension locates the groove almost instantly. The dial indicator is graduated in 0.0001, 0.00025 or 0.0005-mm calibrations. Each size gage can be set by a simple vernier within a wide range of diameters. Setting may be by gage block combinations, micrometers or master ring gages.

Check No. 17 on Reply Card for more Details

Reduces Form Grinding Cost

Use of universal wheel crusher rolls, made by Jerpbak-Bayless Co. Inc., Chagrin Falls, O., with the portable, motorized wheel crusher fixture made by the company, enables crush-form grinding wheels with intricate and multiple forms for tools, dies, production parts, etc. Combination of fixture and crusher rolls assists in reducing form grinding costs and assures a higher degree of accuracy for crush forming grinding wheels. No 1 wheel crusher roll is made with a series of V-grooves in the periphery in which to mount round wire to produce a convex radii in the grinding wheel.

Seven annular grooves allow mounting of all wire sizes in 0.001-inch increments from 0.002-inch diameter through 0.130-inch diameter. No. 4 universal square wire roll is made in the form of a shoulder arbor with precision collar holding the basic square wire in place. A ¼-inch square ring is used in which a concave radius is ground to produce a convex radius on the grinding wheel. Same ring in larger widths can be used to form larger sections of a grinding wheel, such as used on form tools.

Check No. 18 on Reply Card for more Details

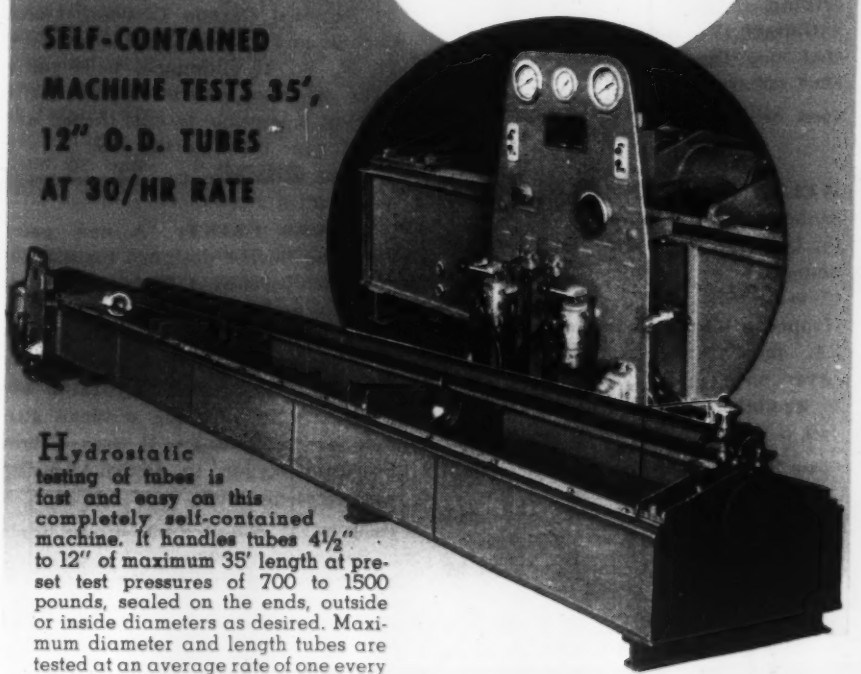
Crimped Solderless Terminals

Combining the advantages of power presses with the ease and flexibility of a hand tool is an air-operated tool for crimping solderless terminals to wire, made by Aircraft-Marine Products Inc., 1597 N. 4th St., Harrisburg, Pa. Detachable heads

R. D. WOOD

Hydraulic TUBE TESTER

SELF-CONTAINED MACHINE TESTS 35', 12" O.D. TUBES AT 30/HR RATE



Hydrostatic testing of tubes is fast and easy on this completely self-contained machine. It handles tubes 4½" to 12" of maximum 35' length at preset test pressures of 700 to 1500 pounds, sealed on the ends, outside or inside diameters as desired. Maximum diameter and length tubes are tested at an average rate of one every 2 minutes, but smaller size or shorter length tubes give proportionately larger production.

The entire cycle of automatic tube admission, centering, clamping, testing, draining and ejection is single-operator worked from one control panel. Write today for complete information.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • RELIEVATORS • INTENSIFIERS

EST. 1803

R. D. Wood Company

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

for either the conventional side position crimping or stub (end) position crimping are provided. Suspension loop is attached to the top of the tool for supporting it from above.

Double handles and triggers provide operation versatility. Tool is capable of handling wire sizes from 6 to 1/0. Air cylinder construction is of seamless tool steel with a safety factor of 300 per cent. Hardened toggle-action crimping jaws insure uniform pressures and a complete crimping cycle from standard air outlets of 85 psi.

Check No. 19 on Reply Card for more Details

Permits Faster Drilling

An increase of drilling speeds up to 50 per cent or more is possible with a drill chip breaker developed by Commander Mfg. Co., 4225 W. Kinzie St., Chicago 24, Ill. Holes are more uniform, smoother, rounder and straighter. Use increases drill life and the number of holes between sharpenings.

The improved drilling is possible because the short chips produced give free cutting action and allow coolant to flow down flutes to reach the point of the drill. In deep hole drilling, it is no longer necessary to withdraw drills to clear long chips that clog the hole, break drills and shut off coolant flow.

Check No. 20 on Reply Card for more Details

• • •

WELDING CABLE: Linconductor cable, a new type of welding cable for both electrode and ground, is announced by Lincoln Electric Co., Cleveland 1, O. The outer cover is Neoprene with a paper separator of 2½ mil thickness between outer cover and copper stranding. Cable is available in the following sizes: 4/0, 3/0, 2/0, 0, Nos. 1, 2, 4 and 6.

Check No. 21 on Reply Card for more Details

SAFE LOCKING RACKS: All steel welded stacking rack with safety interlocking feature is introduced by Palmer-Shile Co., Detroit 27, Mich. Interlocking ends prevents shifting and keeps tiered racks securely in place. Rack has corrugated bottom and I-beam ends.

Check No. 22 on Reply Card for more Details

LIGHTING CONTROL: Bulletin 76 Radiastat dimmers for lighting control purposes are announced by Ward Leonard Electric Co., Mount Vernon, N. Y. Although designed primarily for lamp dimming, they are also suitable for industrial or laboratory use where alternating current voltage applied to the load must be adjustable. Available in two sizes, 13 and 15½-inch diameter, with maximum load ratings of 5500 and 8000 w respectively on 110-120 v, 50-60 cycle service.

Check No. 23 on Reply Card for more Details

MEASUREMENTS AT A GLANCE: Central Tool Co., Cranston, R. I., offers the Read-Rite micrometer. Numbers which appear in the window on the thimble eliminate the computations usually required, as they give the measurement directly. Unit is available in eight models with various ranges.

Check No. 24 on Reply Card for more Details

HANDLES KEGS: Towmotor Corp., Cleveland, O., has developed a device that picks up, transports, stacks and unloads, without a pallet, six 200-pound kegs of spikes in a single maneuver. Both shoes and guide frame of the unit are detachable so that model LT-44 lift truck can be used with standard forks.

Check No. 25 on Reply Card for more Details

HAND THREADER: A new hand threading tool for use with Karbate impervious graphite pipe is offered by National Carbon Division, Union Carbide and Carbon Corp., New York 17, N. Y. It eliminates need for a lathe operation and is easy to carry, making it possible to cut, thread and install pipe right on the job.

Check No. 26 on Reply Card for more Details

REMOVES PAINT: A new paint removing burner designed for attachment to Torchweld 75 hand cutting torch is announced by National Cylinder Gas Co., Chicago 11, Ill. It removes paint from metal as well as scale and rust and dehydrates the metal surface, leaving a clean surface for repainting. It uses a flow of pure oxygen in addition to an oxyacetylene flame.

Check No. 27 on Reply Card for more Details

INDUSTRIAL SWEEPER: Model V industrial sweeper, introduced by Rite-Way Industrial Sweeper Corp., Detroit 26, Mich., is powered by a Continental Red Seal air-cooled 4-cycle engine. It embodies a rotary power driven brush 32 inches long by 8 inches OD, revolving at 250 rpm in a sealed compartment equipped with a high volume vacuum system.

Check No. 23 on Reply Card for more Details

MEASURES DEPTH: For measuring the depth of small holes, recesses, slots, etc., dial depth gage No. 643 is available from L. S. Starrett Co., Athol, Mass. It is also particularly adapted to measuring pipe threads or the result of any cutting, etching or engraving process. Depths up to 0.125-inch are registered directly on the dial in 0.001-inch or plus or minus variations can be directly measured.

Check No. 29 on Reply Card for more Details

CUTTING BLOCKS: Cutting blocks made from Tygon plastic are offered by Colonial Rubber Co., Ravenna, O. They give clean, sharp cuts and stop rejects from double cutting due to "bounce backs". Blocks are adaptable for cutting any material which can be clicked or mallet cut, such as light gage metals, rubber, leather, plastics and paper.

Check No. 30 on Reply Card for more Details

CUTTING OIL: Known as Cool-Cut, a new cutting oil is announced by Turco Products Inc., Los Angeles 1, Calif. It deposits a light, rust preventive film on work and cutting tools, lowers coefficient of friction to minimize tool wear and breakage, reduces chattering, keeps tools and machines clean for smoother, easier cutting. The oil is used in water to create a water emulsion. It has a long tank life, does not change color, separate or turn rancid.

Check No. 31 on Reply Card for more Details

BIT HOLDER: Magna Tool Corp., Buffalo 3, N. Y., introduces a new bit holder, permanently magnetized, for power screw driving. The permanent Alnico magnet in the bit holder permits use of interchangeable screwdriver bits.

Check No. 32 on Reply Card for more Details

RACKS WITH CAPS: Portable coil racks made by Equipment Mfg. Inc., Detroit 5, Mich., have nesting caps welded on tops or bottoms of the upright members to permit easy stacking to any height. Caps are self-centering type so that racks can be readily placed in position by lift truck. Reinforced, open-end design of the racks also eliminates need of a cross member at top of the uprights.

Check No. 33 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

IT IS "business as usual," and plenty of it, in metalworking plants and steel mills despite United States military intervention in Korea.

Our military operations there require only eye-dropper proportions of the war materiel we have on hand. Consequently our move into Korea had little or no immediate effect on industrial production in the United States.

WHAT TO WATCH FOR—But don't be surprised if there are some delayed effects. If the Korean episode is the first shot of a war between the United States and Russia the effects on the metalworking and steel industries will be sweeping, and perhaps quick. If there isn't war, the effects most likely will be a more active, though measured, program of preparedness.

With steel production in the United States at capacity levels any immediate requirements for war would have to filled at the expense of civilian production. If the Korean situation merely accelerates preparedness in the United States, the requirements upon the steel and metalworking industries will be much smaller and be made more gradually than in the case of war. The steel and metalworking industries could perhaps take on a moderately increased preparedness job without cramping civilians. A catching up by industry on civilian demand would free some steel capacity for preparedness needs. There are signs the appliance industry is "over the hump" on filling consumer requirements. Washing machines and gas ranges are in much freer supply and a refrigerator maker is planning to cut production in August or September. Some tapering of agricultural implement production is looked for.

THEY KEPT CALM— There was scarcely a ripple of inquiry from consumers as to whether they could get more steel to build inventories in case of war. Most consumers realize the steel industry is producing all it can and that there just isn't any more steel to be had; and too, with consumers not knowing what they might have to produce in case of war they don't know what kind of steel they would need.

As a result, business and lots of it goes on as usual. Steel continues to be allotted out to consumers and in most instances producers are sold out on most products as far in advance as they care to book orders. While demand is heavy on nearly all steel products, with the notable exception of bolts and nuts, the most intense pressure comes from consumers of carbon sheet and strip.

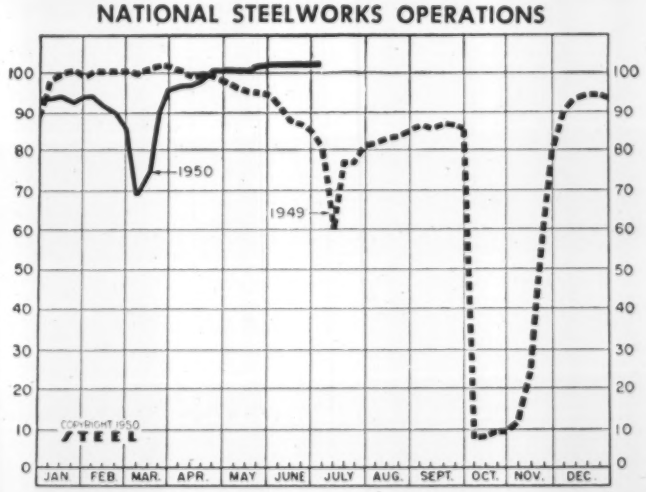
NO LET UP— As a consequence last week was the sixth consecutive one in which the nation's steel industry operated at 101.5 per cent. This kept the tonnage yield at the alltime high. A reduction will come this week, however, as a result of the Fourth of July holiday and the beginning of vacations in the steel industry.

GOING UP—Upward pressure on prices continues and even though increases were scattered they were sufficient to nudge STEEL's weighted index of finished steel prices last week from 156.58 per cent of the 1935-1939 average to 156.69. A year ago it stood at 152.80. STEEL's arithmetical price composite held at $94.36, as all price revisions fell within previously quoted ranges. A year ago the composite was $91.82. Although one small producer of cold-rolled carbon strip raised prices most of the increases last week were on products using nickel, zinc and copper, the prices of which rose last month.

GOING DOWN—One field in which prices have gone down is the scrap market, where they were soaring only a few weeks ago. With weakness continuing last week in that market STEEL's price composite on steelmaking grades dropped to $37.50 from the preceding week's $39.25.

STEEL's pig iron price composites were unchanged from the preceding week: No. 2 foundry, $46.47; basic, $45.97; malleable, $47.27.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended July 1	Change	Same Week 1949	Same Week 1948
Pittsburgh	102	+ 1*	76.5	95.5
Chicago	104.5	— 0.5*	92.5	95
Eastern Pa.	95.5	+ 0.5	74	90
Youngstown	107	+ 1	90	102
Wheeling	100	— 2.5	70.5	85.5
Cleveland	100	0	85.5	90.5
Buffalo	104	0	85	101
Birmingham	100	0	100	100
New England	90	— 2	30	79
Cincinnati	102	— 4	99	102
St. Louis	89	0	83	82
Detroit	109	— 2	106	103
Western	99	+ 3	81.5	..
Estimated national rate	101.5	0	80	95

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.

* Change from revised rate.

Composite Market Averages

	June 29 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39) av.=100)	156.69	156.58	156.13	152.80	101.78
Index in cents per lb. ..	4.245	4.242	4.230	4.139	2.757
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.36	$94.36	$94.23	$91.82	$58.27
No. 2 Fdry. Pig Iron, GT	46.47	46.47	46.47	46.07	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.27	25.29
Steelmaking Scrap, GT..	37.50	39.25	37.17	19.50	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see **STEEL**, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	June 29 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, C. F., Pittsburgh ...	4.10–15	4.15–15	4.10–15	3.95-4.00	2.65
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ..	3.60	3.60	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.50	2.25
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago ...	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C. R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.25–50	3.25–50	3.25	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh ...	4.15–50	4.15–50	4.15	4.00–75	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–45	2.90
Wire, Basic, Pittsburgh ..	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	67.00	36.00
Wire rods, 7/32-⅜", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$25.50
Basic, Valey	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	49.39	26.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.25	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry (Birm.)del.Cin.	49 08	49 08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts...	$41.00	$45.00	$42.50	$21.00	$20.00
No. 1 Heavy Melt. E. Pa..	34.00	35.25	32.50	18.00	18.75
No. 1 Heavy Melt. Chicago	37.50	37.50	36.50	19.50	18.75
No. 1 Heavy Melt. Valley.	41.50	42.50	44.75	18.50	20.00
No. 1 Heavy Melt. Cleve..	39.50	40.50	42.75	15.00	19.50
No. 1 Heavy Melt. Buffalo	39.00	39.75	36.75	19.25	19.25
Rails, Rerolling, Chicago..	47.50	47.50	52.50	27.75	22.25
No. 1 Cast, Chicago	44.50	44.50	48.50	27.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	15.50	15.50	15.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn.	22.50	22.50	20.50	16.00	12.00
Zinc, E. St. Louis	15.00	15.00	13.00	9.00	8.25
Lead, St. Louis	10.80	11.80	11.80	11.85	6.35
Tin, New York	78.25	76.625	78.50	103.00	52.00
Aluminum, del.	17.50	17.50	17.50	17.00	15.00
Antimony, Laredo, Tex. ..	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$
Newark,del.	50.63	51.13	51.63	
Brooklyn,N.Y.,del.	....	52.79	53.29	
Birmingham District				
AlabamaCity,Ala. R2	41.88	42.38	....	
Birmingham R2	41.88	42.38	....	
Birmingham S9	41.88	42.38	....	
Woodward,Ala. W15	41.88	42.38	....	
Cincinnati,del.	....	49.08	....	
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	
Tonawanda,N.Y., W12	46.00	46.50	47.00	
N.Tonawanda,N.Y., T9	....	46.50	47.00	
Boston, del.	55.26	55.76	56.20	
Rochester,N.Y.,del.	48.63	49.13	49.63	
Syracuse,N.Y.,del.	49.58	50.08	50.58	
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	
IndianaHarbor,Ind. I-2	46.00	....	46.50	
So.Chicago,Ill. W14, Y1	46.00	46.50	46.50	
So.Chicago,Ill. C3	46.00	....	46.50	47.00
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.,del.	....	51.98	51.98	
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	
Akron,del. from Cleve.	48.39	48.89	48.89	49.39
Lorain,O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	
Fontana,Calif. K1	52.00	52.50	....	
Geneva,Utah G1	46.00	46.50	....	
Seattle,Tacoma,Wash.,del.	....	54.20	....	
Portland,Oreg.,del.	....	54.20	....	
LosAngeles,SanFrancisco,del. ...	53.70	54.20	....	
GraniteCity,Ill. M10	47.90	48.40	48.90	
St.Louis,del. (incl. tax)	48.65	49.15	49.65	
Ironton,Utah C11	46.00	46.50	....	
Minnequa,Colo. C10	47.00	47.50	47.50	
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N.&S. sides, Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	....	....	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.
Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson,O. G2, J1	$57.00
Buffalo H1	58.00

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2.	82.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged from silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.00
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, June 29, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ..... 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ..... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 ..... 58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 ..... 53.00
Lackawanna,N.Y. B2 ..... 53.00
Munhall, Pa. C3 ..... 53.00
So.Chicago,Ill. C3 ..... 53.00
So.Duquesne,Pa. C3 ..... 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 ..... 65.00
Detroit R7 ..... 66.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 ..... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor,Ind. I-2 ..... 63.00
Johnstown,Pa. B2 ..... 63.00
Lackawanna,N.Y. B2 ..... 63.00
LosAngeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14 ..... 63.00
So.Duquesne,Pa. C3 ..... 63.00
So.SanFrancisco B3 ..... 82.00

Alloy (NT)
Bethlehem,Pa. B2 ..... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 ..... 66.00
Conshohocken,Pa. A3 ..... 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 ..... 85.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Ind.Harbor,Ind. Y1 ..... 66.00
Johnstown,Pa. B2 ..... 66.00
Lackawanna,N.Y. B2 ..... 66.00
LosAngeles B3 ..... 86.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago C3,R2,W14 ..... 66.00
So.Duquesne,Pa. C3 ..... 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Gary,Ind. C3 ..... 76.00
Ind.Harbor,Ind. I-2 ..... 76.00
Massillon,O. R2 ..... 76.00
Munhall,Pa. C3 ..... 76.00
So.Duquesne,Pa. C3 ..... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 ..... 3.15

WIRE RODS
AlabamaCity,Ala. R2 ..... 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 ..... 3.85
Johnstown,Pa. B2 ..... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 ..... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11 ..... 3.85
Pittsburg,Calif. C11 ..... 4.50
Portsmouth,O. P12 ..... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 ..... 3.85
SparrowsPoint,Md. B2 ..... 3.95
Sterling,Ill.(1) N15 ..... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 ..... 4.65
Worcester A7 ..... 4.15

BEARING PILES
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..... 3.40
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ..... 3.40
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.00
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 ..... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 ..... 4.02
Phoenixville,Pa. P4 ..... 3.30
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14 ..... 3.40
So.SanFrancisco B3 ..... 3.95
Torrance,Calif. C11 ..... 4.00
Weirton,W.Va. W6 ..... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 ..... 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Geneva,Utah G1 ..... 5.10
Ind.Harbor,Ind. I-2, Y1 ..... 5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14) B2 ..... 5.20
LosAngeles B3 ..... 5.75
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 ..... 5.15
So.SanFrancisco B3 ..... 5.70
Struthers,O. Y1 ..... 5.15

Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 ..... 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 ..... 5.20
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ..... 4.20
Lackawanna,N.Y. B2 ..... 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 ..... 4.20
Weirton,W.Va. W6 ..... 4.20

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 ..... 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 ..... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Ind.Harbor,Ind. I-2, Y1 ..... 5.35
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 ..... 5.35
SparrowsPoint,Md. B2 ..... 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ..... 4.50
Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 ..... 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2 ..... 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 ..... 4.55
Harrisburg,Pa. C5 ..... 4.55
Ind.Harbor,Ind. I-2 ..... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ..... 3.75
Ashland,lcl(15) A10 ..... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.cl R2 ..... 4.10

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 ..... 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 ..... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 ..... 3.60
Conshohocken,Pa. A3 ..... 3.60
Ecorse,Mich. G5 ..... 3.65
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 ..... 3.85
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2,Y1. ..... 3.50
Johnstown,Pa. B2 ..... 3.50
Lackawanna,N.Y. B2 ..... 3.50
Minnequa,Colo. C10 ..... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa.S3 ..... 3.50
So.Chicago,Ill. C3, W14 ..... 3.50
SparrowsPoint,Md. B2 ..... 3.50
Steubenville,O. W10 ..... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 ..... 3.50
Youngstown C3, R2, Y1 ..... 3.50

PLATES (Universal Mill)
Fontana,Calif. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 ..... 5.25

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..... 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 ..... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1 ..... 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.05
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ..... 3.35
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11 ..... 3.45
Pittsburg,Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14 ..... 3.45
So.Duquesne,Pa. C3 ..... 3.45
S.SanFran.,Cal. B3 ..... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ..... 4.15
Weirton,W.Va. W6 ..... 3.45
Youngstown C3, R2 ..... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 ..... 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 ..... 3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1. ..... 3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 ..... 4.55
Lackawanna,N.Y. B2 ..... 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14 ..... 3.95
So.Duquesne,Pa. C3 ..... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Atlanta A11 ..... 5.35
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1 ..... 5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 ..... 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 ..... 5.20
So.SanFrancisco B3 ..... 5.95
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 ..... 4.15
BeaverFalls,Pa. M12,R2 ..... 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.60
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.35
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 ..... 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13 ..... 4.15
Hartford,Conn. R2 ..... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 ..... 4.55
Massillon,O. R2, R8 ..... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 ..... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 ..... 4.55
Readville,Mass. C14 ..... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 ..... 4.15
SpringCity,Pa.(5) K3 ..... 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 ..... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 ..... 4.90
BeaverFalls,Pa. M12 ..... 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13 ..... 4.90
Hartford,Conn. R2 ..... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 ..... 4.90
Mansfield,Mass. B5 ..... 5.20
Massillon,O. R2, R8 ..... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 ..... 5.10
So.Chicago,Ill. R2, W14 ..... 4.90
Struthers,O. Y1 ..... 4.90
Warren,O. C17 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Worcester,Mass. A7 ..... 5.20
Youngstown F3, Y1 ..... 4.90

RAIL STEEL BARS
ChicagoHts. (3) C2, I-2 ..... 3.30
ChicagoHts. (4) C2, I-2 ..... 3.45
Franklin,Pa.(3, 4) F5 ..... 3.45
FortWorth,Tex.(26) T4 ..... 4.15
Huntngtn,W.Va.(3) W7 ..... 3.45
Marion,O. (3) P11 ..... 3.45
Moline,Ill.(3) R2 ..... 3.40
SouthAvis,Pa.(2) J8 ..... 3.30
Williamsport(2,3) S19 ..... 3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 ..... 8.60
Economy,Pa.(D.R.)B14 ..... 11.00
Economy(Staybolt)B14 ..... 11.30
Dover,N.J.(Staybolt)U1 ..... 15.00
Dover(Eng.Bolt) U1 ..... 13.50
Dover(Wrgt.Iron) U1 ..... 12.25
McK.Rks.(S.R.) L5 ..... 8.60
McK.Rks.(D.R.) L5 ..... 11.25
McK.Rks.(Staybolt) L5 ..... 12.75

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..... 3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 ..... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1 ..... 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.05
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ..... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburgh,Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SandSprings,Okla. S5 ..... 4.35
Seattle,Wash. B3, N14 ..... 4.20
SouthAvis,Pa. J8 ..... 3.45
So.Chicago,Ill. R2 ..... 3.45
So.Duquesne,Pa. C3 ..... 3.45
So.SanFrancisco B3 ..... 4.20
SparrowsPoint,Md. B2 ..... 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ..... 4.15
Youngstown C3, R2 ..... 3.45

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..... 4.50
Johnstown, ¼-1" B2 ..... 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.40
Seattle B3, N14 ..... 5.10
SouthAvis,Pa. J8 ..... 4.35
So.SanFrancisco B3 ..... 5.00
SparrowsPt., ¼-1" B2 ..... 4.35
Williamsport,Pa. S19 ..... 4.35

SHEET, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..... 3.35
Ashland,Ky.(8) A10 ..... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 ..... 3.45
Detroit M1 ..... 4.15
Ecorse,Mich.(8) G5 ..... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1 ..... 3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 ..... 3.35
Munhall,Pa. C3 ..... 3.35
Pittsburg,Calif. C11 ..... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. W14 ..... 3.35
SparrowsPoint,Md. B2 ..... 3.35
Steubenville,O. W10 ..... 3.35
Torrance,Calif. C11 ..... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 ..... 3.35
Youngstown C3, Y1 ..... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..... 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 ..... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Torrance,Calif. C11 ..... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 ..... 5.05
Ecorse,Mich. G5 ..... 5.25
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 ..... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1 ..... 5.05
Irvin,Pa. C3 ..... 5.05
Lackawanna(35) B2 ..... 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C3 ..... 5.05
SparrowsPoint(36) B2 ..... 5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 ..... 5.05
Youngstown, C3, Y1 ..... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 ..... 7.05
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1. ..... 6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna(37) B2 ..... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint(38) B2 ..... 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 ..... 6.20
Youngstown Y1 ..... 6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'vd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED STOCK, 29 Ga.

Yorkville,O. W10	6.00

SHEETS, Culvert No. 16	**Cu Alloy**	**Cu Fe**
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt, B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS,Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron	**An'ld**	**Galv.**
Apollo,Pa. B14	12.00	15.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance, Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

TIN PLATE, American COKE (Base Box)	**1.25 lb**	**1.50 lb**
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING - Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	4.95
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10)	S15.5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10)	S15.5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	3.35
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.50
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.50
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) NS	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.50
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.50
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) NS	5.00
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.50
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.15
Youngstown C8, (40), Y1	4.45

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

STRIP, Cold-Finished, Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61-0.80C**	**0.81-1.05C**	**1.06-1.35C**
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.90
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.90
Cleveland A7	4.15	5.95	6.55	8.50	10.90
Dover,O. G6	4.15	5.95	6.55	8.50	10.90
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.35
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.30
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	...
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.35
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.90
Worcester,Base	4.65	6.25	6.85	8.80	11.35
Sharon,Pa. S3	4.50	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.35
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.30
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.90
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.35
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.30
Youngstown C8	4.15	5.95	6.55	8.50	10.80

Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.90
Harrison,N.J. C18	...	...	9.30	11.25	13.90

TIN PLATE, Electrolytic (Base Box)	**0.25 lb**	**0.50 lb**	**0.75 lb**
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton, W. Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	**Armature Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Parkersburg F4 (cut lengths)	...	...	...	...	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower) Transformer Grade	**72**	**65**	**58**	**52**
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Parkersburg F4 (cut lengths)	9.30	....	....	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	....	....	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel &Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son,Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Co.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Jeslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.65
Youngstown C3	3.40

WIRE MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark, 6-8ga. I-1	5.15
No.Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
SoSanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester, Mass. A7	4.80
Worcester,Mass. T6	*4.95*

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)	An'ld Stone	Galv Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill. K4	126
Crawfordsville M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill(1) N15	126

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½ Ga.

	Col.
AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill. N15	116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

AXLES

Fairfield,Ala. T2	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.60
Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Stock To Dealers & Mfrs. (7)

	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N. Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	9.10
KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.85
Pittsburgh O3, P14	9.10
Seattle B3	9.35

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.35	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo.	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, S8, T7, U4, V2, V3.

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron&Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango FurnaceCo.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.

T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill shipments; to consumers, 4.60c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.75c. 0.035" and heavier.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	35.5	5.5	9.0	7.5
¼	6.0	0.42	33.5	31.5	32.5	5.5	11.0	8.5
⅜	6.0	0.57	29.0	27.0	28.0	0.5	8.0	4.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	27.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	31.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	32.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa, P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1 quotes 2 points lower on ⅛", ¼", ⅜" and 3 points lower on other listed sizes.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6, quotes 1 point lower on ⅛", 1 point higher on ⅜"; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., W10 quotes 3½ points lower on ⅛", 2½ pts on ¼-in., 3 points lower on ⅜" and 1 point higher on other listed sizes. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 9 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	17.5
2½	58.5	5.82	39.0	23.5	39.0	20.5
3	76.5	7.62	39.0	23.5	39.0	20.5
3½	92.0	9.20	41.0	25.5	41.0	22.5
4	$1.09	10.89	41.0	25.5	41.0	22.5
5	1.48	14.81	41.0	25.5	41.0	22.5
6	1.92	19.18	41.0	25.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown, Y1 quotes 3 points lower.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10% Both Sides		—Sheets— Carbon Base 10%	20%	Copper Base Both Sides
302	....	....	....	....	19.75	21.50–22.50	75.00
304	22.50	26.50	....	....	20.75	22.50–24.00	77.00
305	....	....	....	....	....	....	79.00
309	28.00	32.00	....	....	....	....	....
310	34.00	38.00	....	....	....	....	105.00
316	27.00	31.00	....	....	26.00	28.00–32.00	....
317	32.00	36.00	....	....	....	....	....
318	31.00	35.00	....	....	....	....	....
321	....	....	....	....	23.00	25.00	90.00
347	25.00	29.00	....	....	24.00	26.00–30.00	94.00
405	18.75	24.75	....	....	....	....	....
410	18.25	24.25	....	....	....	....	....
430	18.25	24.25	....	....	....	....	....
Nickel	31.00	41.00	31.50	41.00	....	....	88.00
Inconel	39.00	51.00	....	....	....	....	140.00
Monel	32.00	42.00	26.50	33.50	....	....	83.00
Copper*	....	....	20.70†	25.65†	....	....	....

* Deoxidized. † 17.20c for hot-rolled. ‡ 22.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville L7; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S16. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	27
⅝-in. & ⅝-in.	29
¾-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	
½-in. and smaller	25
⅝-in. & ⅝-in.	23
¾-in.-1½-in.	23
1⅝ in. and larger	16

H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅝-in..	28	25
¾-in.-1½-in.	25	23
1⅝ in. & larger	17	16
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	30	27
¾-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

½-in. and smaller	Hvy.	Reg.	Lght.
	35	41	41
⅝-in. & ⅝-in.	30	36	36
¾-in.-1½ in..	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	63.5 & 10
Plated finishes	50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.:	
¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.25c
⅞-in., under	43 off

Washers, Wrought

F.o.b. shipping point, to jobbers ..... Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE —Inches— Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
CARBON		
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Type 301 through 347 sheet, except 309 E2.

Baltimore, bars wire and structurals A10 quotes 1.50c higher.

Brackenridge,Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.

Butler,Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10 quotes 1.50c higher.

Carnegie, Pa., strip except Types 303, 501, 502 and except Type 309 quoted 51.00c S18.

Cleveland, strip, quotes 1.50c higher, except Type 309 quoted 52.50c and except Type 416 A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y. bars, wire A4

Duquesne, Pa., bars C3 quotes 1.50c higher.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6 quotes 1.50c higher.

Gary, Ind., sheets except Type 416 C3 quotes 1.50c higher.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products, except Type 309 strip quoted 51.00c R2.

McKeesport, Pa., bars; sheets except Type 416, C3 quotes 1.50c higher.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2 quotes 1.50c higher.

Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10 quotes 1.50c higher.

Midland, sheets & strip C18

Munhall, Pa., bars C3 quotes 1.50c higher.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip except Type 309 bars quoted 41.00c C4.

So. Chicago, Ill., bars & structurals C3 quotes 1.50c higher.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.

Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7 quotes 1.50c higher.

West Leechburg, Pa., strip, except Type 300 quoted 51.00c A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	25.00
Tuluol, one deg.	18.25-25.75
Industrial xylol	19.75-27.50

Per ton bulk, ovens

Sulphate of ammonia	$32-45

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge Iron:	
98+% Fe, carlots	1.00
Swedish, c.l.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	38.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	28.25-30.25
Copper:	
Electrolytic	31.75
Reduced	31.50
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	66.00
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	88.50
Zinc, 10-ton lots	20.50-28.00
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8%, minus 65 mesh, freight allowed, 1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-85%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connel svll,fur.	$14.00-14.50
Connellsvll,fdry.	15.00-16.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	23.40
Chicago, ovens	21.00
Chicago del.	†22.45
Detroit, del.	24.91
Terre Haute, ovens	21.20
Milwaukee, ovens	21.75
Indianapolis, ovens	20.75
Chicago, del.	24.12
Cincinnati, del.	23.67
Detroit, del.	24.65
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painesville, O., ovens	21.90
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	19.15
Birmingham, del.	20.20
Philadelphia, ovens	21.25
Neville Island,Pa.,ovens	21.00
Swedeland, Pa. ovens	21.20
Portsmouth, O., ovens	20.15
Cincinnati, del.	22.71
Detroit, ovens	21.65
Detroit, del.	22.65
Buffalo, del	24.00
Flint, del.	24.09
Pontiac, del.	23.04
Saginaw, del.	24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or witnin $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.75	6.84	7.40	6.04	...	5.95	6.64	8.60	5.85	6.10	7.54
New York(c'try)	5.55	6.64	7.20	5.84	...	5.75	6.44	8.40	5.65	5.90	7.34
Boston (city) ..	5.95	6.75	7.37	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try) .	5.75	6.55	7.17	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city) ..	6.45	6.60	7.10	5.99	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)..	6.20	6.35	6.85	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.35	...	6.90	5.63	...	5.53	6.30	...	5.63	5.45	7.13
Wash. (w'hse).	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††§	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††§	5.35	5.65	6.95
Pitts.(w'hse) ..	5.15	5.95*	6.60-6.70	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††§	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.30	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse) .	5.15	5.95	7.10	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.05	5.30	...	5.30	5.85	9.75††§	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.85	5.10	...	5.10	5.65	9.55††§	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	6.94	5.44	...	5.44	6.09	9.89††§	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	7.14	5.24	...	5.24	5.89	9.69††§	5.39	5.54	6.74
St. Louis (del.).	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.06	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[3]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[3]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	7.80	6.15	8.55	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.60	5.95	8.35	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[9]	7.60[3]	7.50[2]	7.45[9]	8.25[3]	6.30[9]	7.55	...	6.30[9]	6.40[9]	8.50[9]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—450 to 1499 lb; [6]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lot, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered: Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page 139*)

Lead Drops to 10.80c, St. Louis

Weakness attributed to low ratio of demand to current supplies, plus curtailment in government buying for stockpiling. Refinery stocks drop sharply

New York—Lead consumers are restricting purchases to cover only immediate needs and are placing their orders mainly on an average price basis. This is the usual policy followed during a period of price weakness, the market having dropped ½-cent a pound on June 23 and a like amount June 28. At 10.80c, St. Louis, for common grade, lead is at the lowest level since May 3.

Weakness in the market is attributed chiefly to the fact that the government will curtail its purchases for stockpiling sharply during the current fiscal year. Supplies are ample for industrial requirements.

Cancellation of the reciprocal trade agreement between this country and Mexico, effective Dec. 31, 1950, will have a direct effect on the importation of metal. On Jan. 1, 1951, present import duties on lead ores, bullion and refined metal and scrap will double the current rate. In the first four months of this year, we imported from Mexico 1011 tons (lead content) of ore, matte, etc. and 67,874 tons of pigs and bars, representing about 50 per cent of total imports of lead in that period.

Statistical showing of the industry for May was favorable. Stocks of lead at refineries dropped to 76,236 tons from 86,309 tons at the end of April and compare with 90,471 tons on hand at the end of May, 1949. Shipments of refined lead to domestic consumers increased sharply in May to 45,702 tons from 33,751 tons in April and were the largest reported since January, 1949. Total shipments for the first five months amounted to 149,349 tons compared with 150,100 tons in the like 1949 period. The battery industry has increased its purchases compared with those a year ago while the cable industry has been less active in the market.

Magnesium Product Prices Rise

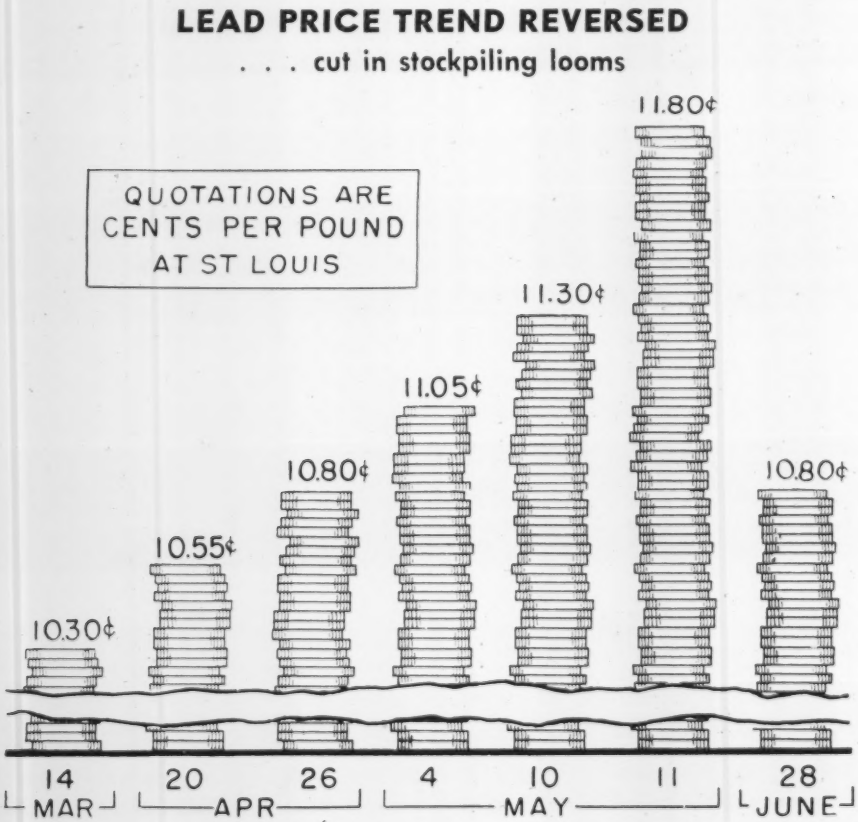
Midland, Mich.—First price increase for magnesium wrought products in four years was announced June 26 by Dow Chemical Co., this city, following the recent increase in primary magnesium price.

Commercial grade Dowmetal FS extrusions were increased 2 cents per pound, and commercial grade Dowmetal M was increased to equal the new FS extrusion prices.

Specification grade FS-1 extrusions were increased 4 cents per pound; specification grade M extrusions are now priced at 2 cents per pound over new commercial grade M extrusions; and special alloy extrusions were revised upward.

LEAD PRICE TREND REVERSED

. . . cut in stockpiling looms



Commercial grade M and FS sheet in mill standard and mill nonstandard sizes was increased 4 cents a pound in all gages from 0.032 in. and heavier; specification grade M and FS-1 sheet in the same sizes and gages was increased 6 cents. Prices remain unchanged for tread plate in all gages and sheet in gages below 0.032 in.

Prices of special commodity items in sheet and plate were revised upward.

Tin Prices Turn Upward

New York—Tin prices turned upward rather sharply last week following the outbreak of hostilities in Korea. Reflecting the price advance in Singapore, Straits tin prices here rose to 78.25c from 76.50c on June 22. Consumers are not showing any undue alarm over supplies, since they have substantial reserves which are supplemented by larger government stocks. Tin plate makers have an average of four months' supply. The advance in prices is supported mainly by dealers' purchases.

Strikes Close Copper Properties

New York—With copper supplies tight, labor difficulties at mines and refineries continue to sway sentiment in the market here. American Metal Co.'s large Carteret refinery was closed by a wildcat strike on Wednesday while miners at the Roan Antelope copper mines in Northern Rhodesia were struck on the same day. American Smelting & Refining Co.'s Garfield, Utah, smelter was shut down as a result of a railroad switchmen's strike on Wednesday. Partly counteracting these developments, the strike ended last week at Anaconda Copper Mining Co.'s Chuquicamata mines in Mexico.

Trade authorities feel confident that Congress will extend the suspension of the copper import duty, although action was not taken in time to prevent the duty from going into effect, temporarily at least, on July 1. Western copper bloc senators refused to compromise on the 2-cents a pound import duty. Cost of foreign copper will be uncertain until final draft of the bill is known, since it may be made retroactive.

Buying maintains a steady pace with bookings again having exceeded 100,000 tons in June.

Riverside Expands Strip Mill

Riverside, N. J.—Two new nonferrous strip mill units have been placed in operation at the local plant of Riverside Metal Co. One is a fully automatic 4-high mill, with a speed of up to 400 ft per minute, built by the United Engineering Co., Pittsburgh. The other is a smaller unit built by the M. & N. Engineering Co., Wood River, Ill., for rolling smaller gage material. The latter will have a speed of up to 250 ft per minute.

These installations represent the first step in the complete modernization of the company's strip mill, which occupies the northwest end of the main plant.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 22.50c, Conn. Valley; Lake 22.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 21.75-22.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.50c; No. 1 yellow (No. 405) 18.25-19.00c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.10c, delivered.

Lead: Common 10.80c; chemical 10.90c; corroding 10.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 18.25-18.75c; No. 12 foundry alloy (No. 2 grade) 17.75-18.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.75c; grade 2, 18.00c; grade 3, 17.25c; grade 4, 16.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 21.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt, July and Aug. del. 78.25c.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese and Yugoslavian, 22.00c; English and Belgian, prompt, 23.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $70-$73 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2.15 del.; special or patented shapes, $2.30.

Cobalt: 97-99%, $1.80 per lb for 550 lb (keg); $1.80 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $66-69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 22.50-cent copper.)

Sheet: Copper 37.43; yellow brass 34.19; commercial bronze, 95%, 37.38; 90%, 36.93; red brass, 85% 35.96; 80%, 35.52; best quality, 35.04; nickel silver, 18%, 48.39; phosphor-bronze, grade A, 5% 55.11.

Rods: Copper, hot-rolled 33.28; cold-drawn 34.53; yellow brass free cutting, 28.54; commercial bronze, 95% 37.07; 90% 36.62; red brass 85% 35.65; 80% 35.21.

Seamless Tubing: Copper 37.47; yellow brass 37.20; commercial bronze 90% 39.59; red brass 85% 38.87; 80% 38.43.

Wire: Yellow brass 34.48; commercial bronze, 95% 37.67; 90% 37.22; red brass, 85% 36.25; 80% 35.81; best quality brass 35.33.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 26.67, l.c.l. 27.17, 100,000 lb lots 26.545; weatherproof, f.o.b. eastern mills, c.l. 28.10, l.c.l. 28.60, 100,000 lb lots 27.85; magnet, del., 15,000 lb or more 32.50, l.c.l. 33.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....
2.125-2.500	33.0	....	....
2.625-3.375	32.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $16.00 per cwt; add 50c cwt. 10 sq ft to 140 sq ft. Pipe: Full coils, $16.00 per cwt. Traps and bends: List prices plus 40%.

ZINC

Sheets, 20.75c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.00c; over 12-in., 20.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 75.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip, cold-rolled, 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-57.50c; 25 to 99 lb, 45.00-47.50c; 100 lb to 5000 lb, 37.50-38.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 34.09c; oval 33.59c; cast 32.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 51.40c, under 1000 lb 49.40c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 28.00c; over 200 lb, 27.00c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c; 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 29.50c; 400-lb bbl. 27.50c up to 10,000 lb, 27.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 93.00c, 500 to 999 lb, 93.5c; 200 to 499 lb, 94.00c; less than 200 lb, 95.5c, ball, 1000 lb and over, 95.25c; 500 to 999 lb, 95.75c; 200 to 499 lb 96.25c; less than 200 lb, 97.75c, f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 59.2c; 100 or 300 lb drums only, 100 to 500 lb, 50.9c; 600 to 1900 lb, 48.5c; 2000 to 9900 lb, 46.8c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 44.6c, 10 or more drums 42.6c, f.o.b. Niagara Falls, N. Y.; 45.85c and 43.85c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	19.50	19.50	18.75
Yellow Brass	16.75	16.50	15.50
Commercial Bronze			
95%	18.50	18.25	17.75
90%	18.375	18.125	17.625
Red brass			
85%	18.125	17.875	17.375
80%	17.875	17.625	17.125
Best Quality(71-80%)	17.50	17.25	....
Muntz metal	15.75	15.50	15.00
Nickel, silver, 10%	19.12½	18.87½	9.56¼
Phos. bronze, A	19.75	19.50	18.50
Naval brass	16.12½	15.87½	15.37½
Manganese bronze	16.12½	15.87½	15.25

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 19.50; No. 2 copper 18.50; light copper 17.50; composition red brass 16.50; radiators 13.50; heavy yellow brass 12.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.50; No.2 copper 18.50; light copper 17.50; refinery brass (60% copper) per dry copper content 17.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 17.75-18.00; No. 2 16.50-16.75; light copper 15.50-15.75; No. 1 composition red brass 14.25-14.50; No. 1 composition turnings 13.75-14.00; mixed brass turnings 8.75-9.00; new brass clippings 15.00-15.25; No. 1 brass rod turnings 13.25-13.50; light brass 8.75-9.00; heavy yellow brass 10.00-10.25; new brass rod ends 13.50-13.75; auto radiators, unsweated 11.00-11.25; cocks and faucets, 12.75-13.00; brass pipe 13.00-13.25.

Lead: Heavy 9.00-9.25; battery plates 4.75-5.00; linotype and stereotype 11.00-11.25; electrotype 9.25-9.50; mixed babbitt 9.25-9.50.

Zinc: Old zinc 8.00-8.25; new die cast scrap 8.25-8.50; old die cast scrap 5.50-5.75.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00; No. 1 babbitt 30.00-32.00.

Aluminum: Clippings 2S 11.50-12.00; old sheets 8.50-9.00; crankcase 8.50-9.00; borings and turnings 5.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 28-29	22.50	10.80	15.00	78.25	17.50	24.50	48.00	72.75
June 27	22.50	11.30	15.00	78.25	17.50	24.50	48.00	72.75
June 26	22.50	11.30	15.00	77.50	17.50	24.50	48.00	72.75
June 23-24	22.50	11.30	15.00	76.375	17.50	24.50	48.00	72.75
June 22	22.50	11.80	15.00	76.50	17.50	24.50	48.00	72.75
June 21	22.50	11.80	15.00	76.875	17.50	24.50	48.00	72.75
June 20	22.50	11.80	15.00	76.75	17.50	24.50	48.00	72.75
June 19	22.50	11.80	15.00	77.00	17.50	24.50	48.00	72.75
June 15-17	22.50	11.80	15.00	77.25	17.50	24.50	48.00	72.75
June 14	22.50	11.80	15.00	78.00	17.50	24.50	48.00	72.75
June 13	22.50	11.80	15.00	77.625	17.50	24.50	48.00	72.75
June 12	22.50	11.80	15.00	77.75	17.50	24.50	48.00	72.75
June 9-10	22.50	11.80	14.50	78.25	17.50	24.50	48.00	72.75
June 7-8	22.50	11.80	14.50	78.375	17.50	24.50	48.00	72.75
June 6	22.50	11.80	14.50	78.00	17.50	24.50	48.00	52.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, June 29, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

June 29	$37.50
June 22	39.25
May 1950	33.82
June 1949	20.85
June 1945	19.07

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$41.00*
No. 2 Heavy Melt.	39.00§
No. 1 Busheling	*41.00*
No. 1 Bundles	*41.00*
No. 2 Bundles	35.00-36.00§
Heavy Turnings	36.00-37.00
Machine Shop Turnings	30.00-31.00†
Mixed Borings, Turnings	30.00-31.00†
Short Shovel Turnings	33.50-34.50
Cast Iron Borings	29.50-30.50
Low Phos. Steel	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-38.00
No. 1 Machinery Cast	*43.00-43.50*
Charging Box Cast	*41.00-41.50*
Heavy Breakable Cast	*36.50-37.50*

Railroad Scrap*

No. 1 R.R. Heavy Melt.	47.00
Rails, Random Lengths	45.00-46.00
Rails, 2 ft. and under	46.50-47.00
Rails, 18 in. and under	47.50-48.50
Railroad Specialties	50.00-51.00
Axles	45.00-46.00
Angles, Splice Bars	46.00-47.00

* Nominal.
† Crushers' buying prices.
§ Brokers paying $34 to $35 for No. 2 heavy melting and No. 2 bundles; $40 for No. 1 open hearth grades.

CLEVELAND

No. 1 Heavy Melt. Steel	*$39.50**
No. 2 Heavy Melt. Steel	*34.50**
No. 1 Busheling	*39.50**
No. 1 Bundles	*39.50**
No. 2 Bundles	30.50*
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	28.50-29.50
Short Shovel Turnings	28.50-29.50
Cast Iron Borings	28.50-29.50
Low Phos.	*41.50-42.00*

Cast Iron Grades

No. 1 Cupola	46.00-47.00
Charging Box Cast	42.00-43.00
Stove Plate	41.00-42.00
Heavy Breakable Cast	39.00-40.00
Unstripped Motor Blocks	32.00-34.00
Brake Shoes	34.00-35.00
Clean Auto Cast	46.00-47.00
No. 1 Wheels	42.00-43.00
Burnt Cast	36.00-37.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00*
R.R. Malleable	49.00-50.00
Rails, 3 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, Random Lengths	48.00-49.00
Cast Steel	41.50-42.00
Railroad Specialties	42.50-43.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-50.50

* Nominal.

VALLEY

No. 1 Heavy Melt. Steel	*$41.50**
No. 2 Heavy Melt. Steel	*36.50**
No. 1 Bundles	*41.50**
No. 2 Bundles	32.50*
Machine Shop Turnings	28.00-28.50
Short Shovel Turnings	30.50-31.00
Cast Iron Borings	30.50-31.00
Low Phos.	*43.50-44.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00*

* Nominal.

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$33.50-34.50**
No. 2 Heavy Melt. Steel	*30.50-31.50**
No. 1 Busheling	*32.50-33.50**
No. 1 Bundles	*33.50-34.50**
No. 2 Bundles	*27.00-27.50**
Machine Shop Turnings	24.00-25.00
Short Shovel Turnings	25.00-26.00
Mixed Borings, Turnings	*22.00-23.00*
Low Phos. Punchings and Plate, elec. fur. grade	*38.00-38.50*
Low Phos. Plate, 5 ft & Under	*38.00-38.50*
Elec. Furnace Bundles	*34.50-35.50*
Heavy Turnings	*33.50-34.50*
No. 1 Chemical Borings	34.00
Knuckles and couplers	*40.00-41.00*
Steel car wheels	*40.00-41.00*

Cast Iron Grades

No. 1 Cupola Cast	36.00
No. 1 Machinery Cast	39.00-40.00
No. 1 Yard Cast	34.00-35.00
Charging Box Cast	*35.50-36.50*
Heavy Breakable Cast	*35.50-36.50*
Unstripped Motor Blocks	29.00
Clean Auto Cast	39.00-40.00
No. 1 Wheels	41.00-42.00
Malleable	45.00-46.00

*Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	*$37.00*
No. 2 Heavy Melt. Steel	*31.00*
No. 1 Busheling	*37.00*
No. 1 Bundles	*37.00*
No. 2 Black Bundles	*30.00*
No. 3 Bundles	*26.00*
Machine Shop Turnings	21.00
Short Shovel Turnings	24.00
Mixed Borings, Turnings	23.00
Cast Iron Borings	24.00

Cast Iron Grades

No. 1 Cupola Cast	47.00
Charging Box Cast	*36.00*
Stove Plate	33.00
Heavy Breakable Cast	*36.00*
Unstripped Motor Blocks	29.00
Brake Shoes	26.00
Clean Auto Cast	47.00
Drop Broken Cast	49.00
Low Phos., 18 in. and under	47.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00
R.R. Malleable	44.00
Rails, Rerolling	44.00
Rails, Random Lengths	41.00
Rails, 18 in. and under	50.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$27.00-28.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	*25.50-26.00*
No. 1 Busheling	*37.50-38.00*
Machine Shop Turnings	*22.50-23.00*
Forge Flashings	*36.50-37.00*
Short Shovel Turnings	*24.50-25.00*
Cast Iron Borings	*24.50-25.00*
Punchings & Plate Scrap	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	*39.00-40.00*
Heavy Breakable Cast	*34.00-35.00*
Clean Auto Cast	*43.00-44.00*

BUFFALO

No. 1 Heavy Melt. Steel	*$38.50-39.50*
No. 2 Heavy Melt. Steel	*35.50-36.00*
No. 1 Busheling	*35.50-36.00*
No. 1 Bundles	*36.50-37.00*
No. 2 Bundles	*33.50-34.00*
Machine Shop Turnings	*29.50-30.00*
Mixed Borings, Turnings	*29.50-30.00*
Cast Iron Borings	*29.50-30.00*
Short Shovelings	*31.50-32.00*
Low Phos.	*41.50-42.00*

Cast Iron Grades

No. 1 Cupola	35.50-36.00
No. 1 Machinery	38.50-39.00
Malleable	32.50-33.00

Railroad Scrap

Rails, 2 ft. and under	46.50-47.00
Rails, random size	40.50-41.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$30.00-31.00*
No. 2 Heavy Melt. Steel	26.00-27.00
No. 1 Busheling	*29.00-30.00*
No. 1 Bundles	*30.00-31.00*
No. 2 Bundles	*24.00-25.00*
Machine shop Turnings	18.50-19.00
Mixed Borings, Turnings	*18.50-19.00*
Short Shovel Turnings	*20.00-20.50*
Punchings & Plate Scrap	*30.00-31.00*
Low Phos. Plate, 5 ft & under	*30.00-31.00*
Elec. Furnace Bundles	*30.00-31.00*

Cast Iron Grades

No. 1 Cupola Cast	29.00-29.50
No. 1 Machinery	30.00-31.00
Charging Box Cast	28.50-29.50
Heavy Breakable	28.50-29.50
Unstripped Motor Blocks	*21.00-22.00*

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$28.50-29.00*
No. 2 Heavy Melt. Steel	*23.50-24.50*
No. 1 Bundles	*28.50-29.50*
No. 1 Busheling	*28.00-28.50*
Machine Shop Turnings	*19.00*
Mixed Borings, Turnings	*17.50-18.00*
Short Shovel Turnings	*22.00-23.00*
Bar Crops and Plate	30.50-31.50
Punchings & Plate Scrap	30.50-31.50
Chemical Borings	21.00-21.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	28.00-29.00
Heavy Breakable Cast	31.00-32.00
Stove Plate	26.50-27.00

CHICAGO

No. 1 Heavy Melt. Steel	$37.00-38.00
No. 2 Heavy Melt. Steel	35.00-36.00
No. 1 Bundles	35.00-36.00
No. 2 Bundles	32.00-33.00
Machine Shop Turnings	23.50-24.50
Mixed Borings, Turnings	23.50-24.50
Short Shovel Turnings	24.00-25.00
Cast Iron Borings	24.00-25.00
Low Phos.	39.00-40.00
Elec. Furnace Bundles	37.00-38.00
Heavy Turnings	29.00-30.00
Cut Structurals	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	44.00-45.00
Clean Auto Cast	44.00-45.00
No. 1 Wheels	38.00-39.00
Stove Plate	37.00-38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-40.00
Malleable	44.00-45.00
Rails, Rerolling	47.00-48.00
Rails, Random Lengths	41.00-42.00
Rails, 2 ft and under	45.00-46.00
Rails, 18 in. and under	46.00-47.00
Railroad Specialties	41.00-42.00
Angles, Splice Bars	43.50-44.50

BIRMINGHAM

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
No. 2 Bundles	27.00-28.00
Machine Shop Turnings	25.00-26.00
Mixed Borings, Turnings	26.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	37.00-38.00
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00
Stove Plate	33.00-34.00
No. 1 Wheels	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	35.00
R.R. Malleable	nominal
Rails, Rerolling	44.00-45.00
Rails, 2 ft and under	nominal
Angles and Splice Bars	40.00-41.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$36.00-38.00
No. 2 Heavy Melt. Steel	33.00-35.00
No. 1 Bundles	36.00-38.00
No. 2 Bundles	33.00-35.00
No. 3 Bundles	29.00-30.00
Machine Shop Turnings	23.00-24.00
Short Shovel Turnings	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	39.00-41.00
Charging Box Cast	36.00-38.00
Heavy Breakable Cast	38.00-39.00
Brake Shoes	37.00-39.00
Clean Auto Cast	40.00-42.00
Burnt Cast	35.00-36.00

Railroad Scrap

R.R. Malleable	39.00-41.00
Rails, Rerolling	52.00-53.00
Rails, Random Lengths	41.00-43.00
Rails, 3 ft and under	47.00-49.00
Uncut Tires	41.00-43.00
Angles, Splice Bars	46.00-48.00
Railroad Specialties	45.00-46.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Bundles	18.00
No. 2 Bundles	17.00
No. 3 Bundles	15.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Random Lengths	22.00

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	17.50
Nos. 1 & 2 Bundles	18.00
No. 3 Bundles	16.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.50-30.00
Cut Structurals	27.50-30.00

Cast Iron Grades

No. 1 Cupola Cast	27.50
Heavy Breakable Cast	27.50
Stove Plate	25.00
Unstripped Motor Blocks	25.00
Malleable	27.50
Brake Shoes	25.00
Clean Auto Cast	30.00
No. 1 Wheels	30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00
Railroad Malleable	27.50
Rails, Random Lengths	21.00
Angles and Splice Bars	21.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	13.00
Machine Shop Turnings	5.00
Mixed Borings, Turnings	5.00
Punchings & Plate Scrap	30.50

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Rerolling	33.00

HAMILTON, ONT.

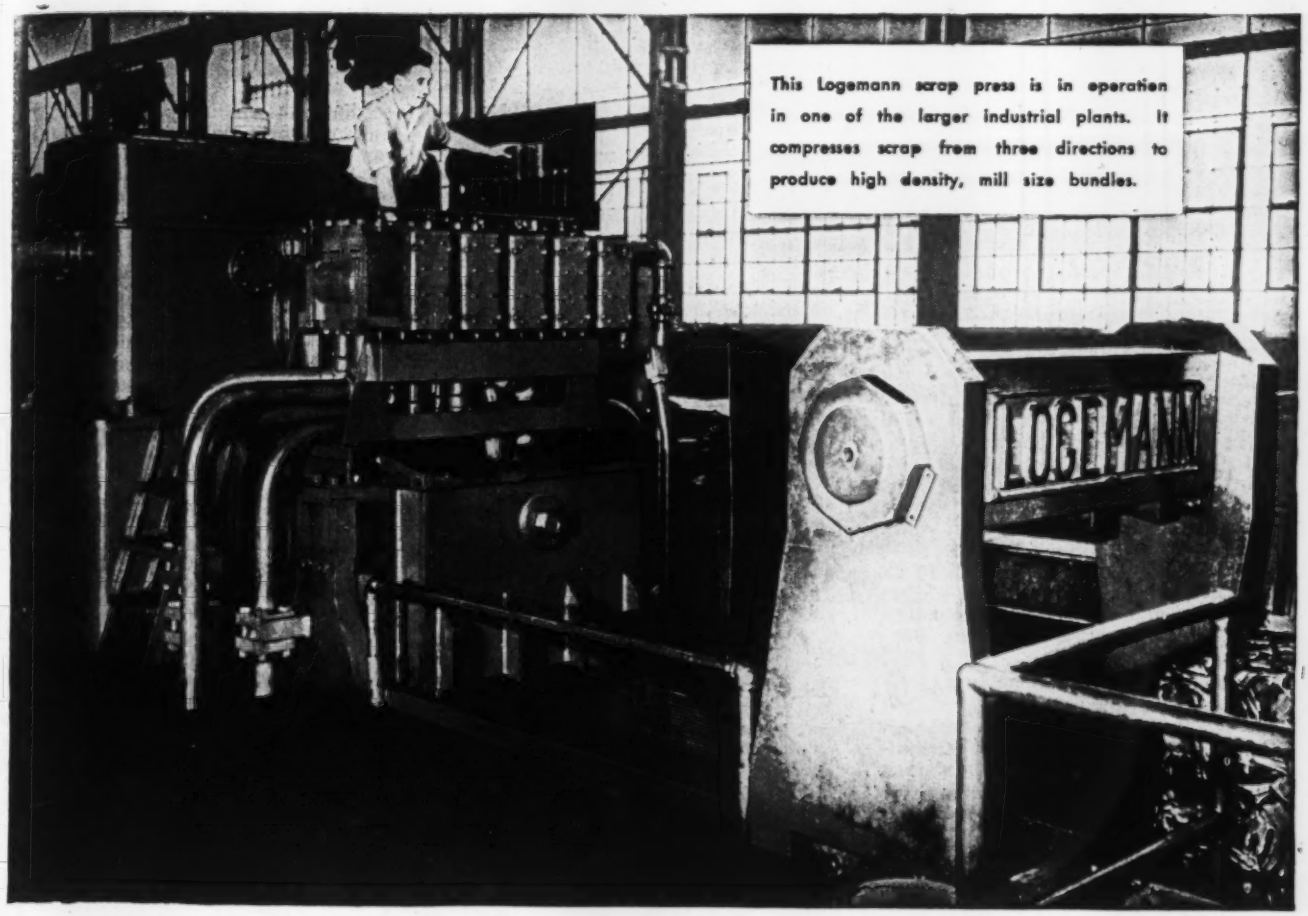
(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades

Cast	40.00-41.00*

* F.o.b. shipping point.



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Sheets Strip . . .

Sheet and Strip Prices, Page 121-122

Philadelphia—While sheet sellers have not as yet opened books for fourth quarter, they unquestionably will have considerable third quarter tonnage to work off in that period. Only in a few specialties are they fairly current. In stainless sheets they can still accept business for third quarter shipment. Stainless strip is another matter. Here some mills are virtually covered for the remainder of the year. A number of metalworking plants are planning to close down over the next few weeks for mass vacations. Interestingly, in view of the great pressure for light flat products, the great majority have laid no plans for taking in steel during the period of suspension. Refusal of labor to co-operate in this respect is said to be responsible in some cases.

German hot-rolled sheets 18 to 22 gage are being offered here at slightly less than standard warehouse prices for shipment, beginning September.

Boston—With mill capacity sold for third quarter and allocations revised downward for that period, volume accumulating for last quarter scheduling is heavy. This is especially true of electrical sheets. Purchase of enough flat-rolled steel to maintain current operations during next three months will be a problem for many consumers. Price is no factor in efforts to acquire steel, buyers paying higher freight costs willingly to get on mill books at more distant points. Two producers of cold strip have not yet followed the $7 ton advance, but are unable to take on additional volume from consumers who seek this price advantage.

New York—As sheet producers opened their books for the fourth quarter on major grades, they are virtually out of the market. A substantial portion of orders originally scheduled for third quarter will not be handled until later. On some of the specialties producers are accepting orders for delivery over the remainder of the year. On stainless strip, certain producers are booked up solidly through December. Stainless sheet deliveries are far less extended, although backlogs are accumulating.

Pittsburgh—Hot and cold-rolled deoxidized copper clad strip has been advanced 70 cents per 100 pounds clad both sides by Superior Steel Corp., Carnegie, Pa.; one side clad was increased 35 cents. American Cladmetals Co., Carnegie, Pa., has advanced copper base sheets, Inconel, clad both sides, from $115 to $140 per 100-pound base. Carnegie-Illinois has reduced its mill price 2½ cents to 40 cents per pound on 17 T.V. special grade of flat-rolled stainless steel, effective June 26, used in the manufacture of cones for television tubes. Thomas Steel Co., Warren, O., Cold Metal Products Co., Youngstown, and Elliott Bros. Co., New Castle, Pa., are now quoting $4.50 per 100-pound base on cold-rolled carbon strip, the latter two companies on $4.75 base for 20 gage and heavier, advance in each instance being $7 per ton. Breakdown of two motor generators on 5-stand cold-reduction mill at Irvin Works of Carnegie-Illinois will force shutdown of that unit through most of this week, resulting in substantial loss in production of cold-rolled sheets and tin plate.

Cincinnati—Sheet mills expect little or no easing of pressure for tonnage because of fabricators' vacations. Although deliveries on cold-rolled are most extended, demand for stainless and electrical sheets and other specialties is strong.

Chicago—Additional sheet and strip cold-rolling capacity is needed in this district. Mills are helpless to close the gap between demand and supply under the unprecedentedly high requirements from all sectors, despite sustained record-shattering output. Capacity operations at least through first quarter are not unlikely. Price steadiness continues on strip in this area.

Joslyn Mfg. & Supply Co., Chicago, has increased its stainless bar and wire prices 1.50 cents a pound, effective June 28.

St. Louis—Pressure for cold-rolled sheets continues heavy especially from users outside this district. Increasing tonnage is being offered on the gray market at 10.00c to 11.00c a pound. Sheet production remains at capacity without making any apparent dent in demand. Mills are six weeks behind on deliveries of nearly all cold-rolled products.

Birmingham — Sheet supply is slightly tighter. Third quarter bookings are heavy. A sizable tonnage of strip is being rolled, chiefly cotton ties and barrel hoops.

Los Angeles—Mills are receiving inquiries for flat-rolled from hopeful fabricators as far east as Chicago. Producers can accept no new business. Even distributors are receiving as little as 20 tons of flat-rolled monthly.

San Francisco—Demand for flat-rolled products shows no sign of easing. Supplies still remain critically scarce.

Wire . . .

Wire Prices, Page 123

Boston — Only scattered openings are available for third quarter wire volume, including some low carbon items. Deliveries on the latter average six to eight weeks, but are lengthening with most mills. Distributors' inventories of rope are substantial. Demand is marked by a spurt in buying of spring wire for bedding and upholstery.

New York—Strong demand for wire is marked by diversity of requirements, notably high carbon grades and specialties. Buying is unabated for automobile assembly; is heavier for textile machinery. Galvanizing extras have been advanced on some fabricated products. On most major products, mill schedules are filled for third quarter; on specialties, into fourth quarter. Rods are in better supply, imports of semi-finished being heavier.

Birmingham — Manufacturers wire is in good demand and most needs are being met satisfactorily. Nail buying is lighter.

Steel Bars . . .

Bar Prices, Page 121

Chicago—Amount of bar carryover tonnage varies widely between mills; some are sold out into September. Cold-finished bars are in limited supply, due to stringency of hot material and to high level of demand. Some implement makers are going out of normal supply channels to cover a considerable portion of their requirements. Some tapering of implement production is looked for; combine output likely will be cut moderately as the result of crop failures. Normal summer letdown in metalworking industries generally, however, is not looked for.

New York—Pressure for carbon steel bars continues. Some sellers are virtually booked up for the remainder of the year on the smaller sizes. On the heavier sizes, orders can be accepted for late August and September shipment. Certain producers have not opened books for the fourth quarter.

Orders are diversified, with particular pressure from cold drawers, whose stocks of hot material are low and who are experiencing a stiff demand for cold-finished steel. Most cold drawers find it difficult to promise shipments for third quarter where they haven't the rough stock on hand. Where they have, around four weeks is the general rule.

Demand for alloy bars still lags.

Boston — Many hot-rolled carbon bar consumers are seeking to build inventories and cover needs through balance of this year. Warehouses also are placing larger and more extended orders. Cold finishing mills are pressing for tonnage to meet schedules; forge shops maintain consumption.

Philadelphia—Most bar sellers are carrying substantial second quarter tonnage into the new period. Demand over recent weeks spurted appreciably and some of the leading producers are not only out of the market for third quarter on the smaller sizes but are booked well into the fourth quarter.

At least two producers have little tonnage available in the smaller sizes before December. On the heavier sizes they are generally booked through the third quarter and into the fourth. Heavy demand is coming out from the cold drawers for rounds 1⅛ inch and under and for flats 3½ inches and under.

Pittsburgh—Alloy bar producers are scheduled into September on most open-hearth grades; openings are still available in August schedules on electric furnace specifications, with exception of bearing grade. Order volume has improved in past few weeks, due partially to speculative buying for inventories following an increase in military inquiries. Bright outlook for automobile and truck production is expected to be major factor sustaining present high level demand for alloy bars. Some merchant carbon bar consumers are substituting alloys to supplement unbalanced inventories. An increase in alloy bar prices is pending to reflect 8 cents per pound increase in nickel.

Tubular Goods . . .

Tubular Goods Prices, Page 124

Pittsburgh — Jones & Laughlin Steel Corp. increased galvanized pipe $6 per ton, or three points lower discount, on ½-in. through 14 in., effective June 26. Bethlehem took similar action on June 22, and National Tube Co. advanced its galvanized pipe prices $6 per ton on June 28.

The 360-mile pipe line of the Tuscarora Oil Co. Ltd., between Linden, N. J., and Pittsburgh is being completely replaced.

A. M. Byers Co. advanced galvanized wrought iron pipe $6 a ton, effective June 22.

Plates . . .

Plate Prices, Page 121

New York—While most mills are booked through third quarter on light gage plate, some capacity is left for heavier gages in August and September. Plate makers generally have not opened books for fourth quarter, but where an attractive order is presented, some will enter for shipment beyond September.

Worth Steel Co., Claymont, Del., is suspending rolling operations for the first week in July for mass vacations. Remaining time due on vacations will be worked off on a stagger basis. Alan Wood Steel Co., Conshohocken, Pa., will suspend its plate department for at least the first three weeks of August for vacations and repairs. Other leading producers indicate that they may set vacations up on a stagger system rather than suspend entirely.

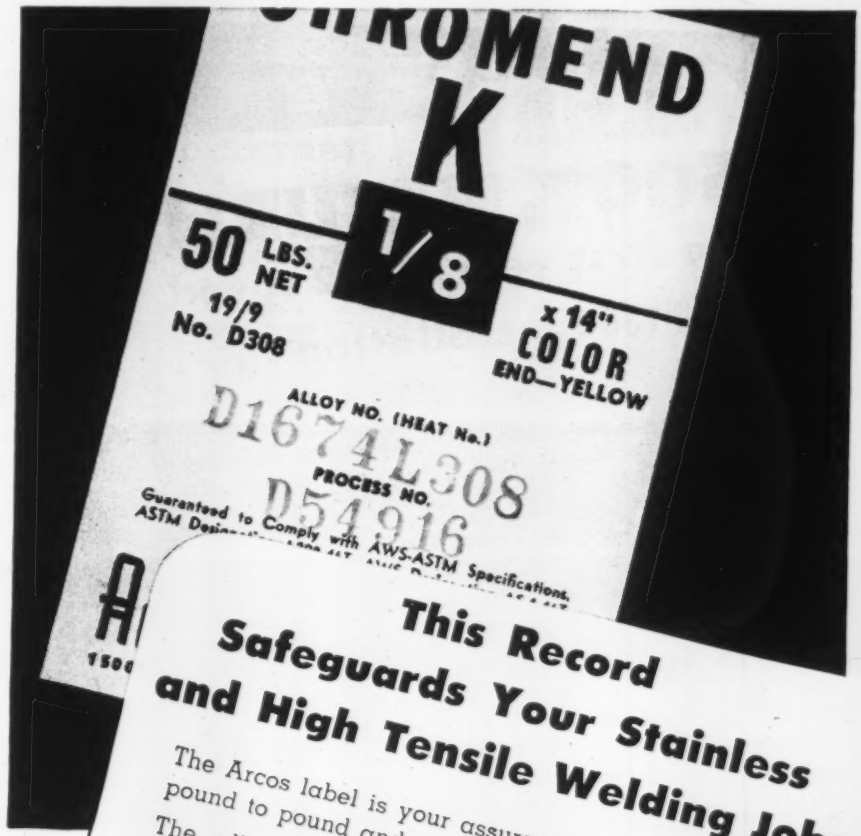
Lukens Steel Co., Coatesville, Pa., increased prices on nickel, inconel and monel clad plate. Stainless clad has undergone no recent change in price.

Philadelphia — While plate producers are fairly well current on commitments, all are sold out for the quarter on lighter gages and well into September on the heavier. One leading eastern producer plans to place plates under allocation in the fourth quarter. Sellers generally haven't as yet opened their books for that period although some business of the more attractive character has been taken.

Boston—Plate deliveries are more extended; fabricators are unable to place full requirements for lighter gages. So strong is demand for large diameter pipe and freight cars, tonnage left for general distribution is reduced. Tank needs are beyond expectations. Weldment shops are again near postwar peak levels.

Chicago—Present low inventories and insufficient allotments are causing freight car builders to scratch around for plates. July and August will be critical periods for some users. Most major users would increase their orders if mills would take the business, but capacity limitations, plus the high carryovers, leave supply far short of present demand.

Birmingham — Plate production holds at a high level but no material progress is being made in closing the gap between supply and demand. There is not much prospect for im-



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provement in plate supplies this year. Pressure containers and tanks continue to take a large tonnage.

Los Angeles—Some fabricators are turning down business due to lack of steel. One fabricator of industrial equipment can obtain only 25 per cent of the 12 gage hot-rolled plate it needs. Observers see no easing in demand and expect little improvement in supply.

San Francisco — Fabricators' demands for plates are expanding, especially in the light gages. Supplies are tight.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 121

Chicago—Reinforcing bar producers are having difficulty meeting delivery promises. Fabricators' stocks are being depleted at a faster rate than mills are replenishing. District shops have comfortable backlogs, although a few large jobs are held back by financing difficulties. Supply pinch is expected to be aggravated by mill vacations. Calumet Steel Division of Borg-Warner Corp. will be closed down for two weeks in July.

Seattle—Rolling mill operations are steady, small orders predominating. Northwest Steel Rolling Mills Inc., Seattle, will close the first half of July for vacation and repairs.

Structural Shapes . . .

Structural Shape Prices, Page 121

New York—Award of close to 7000 tons for the new Chrysler office building addition features continued brisk demand for structural steel. Amount of private construction is increasing. Fabricators see high shop operations for several months to come.

May bookings of 183,373 tons were only slightly less than the high 189,420 tons booked in March, the biggest month since early 1948. Bookings for the first five months are estimated at 762,203 tons, 26 per cent greater than for the like 1949 period.

May shipments were steady at 157,189 tons. Total shipments of 740,186 tons for the first five months were about 36 per cent greater than the average for the same months in the pre-war period 1936-1940.

Backlogs for the four months beginning with June have increased to 577,823 tons.

Boston — Deliveries on fabricated structural steel are more extended with plain material shipments now in September. Volume of new work estimating is maintained, some slackening in bridges being balanced by school buildings and the like.

Philadelphia — While considerable structural work is being figured, awards momentarily are light. Substantial tonnages are scheduled for placement this month.

Birmingham—Fabricators are reasonably busy, but most projects are relatively small. Backlogs in most instances are small.

Los Angeles — Structural shapes and merchant bars are the only steel products producers are able to offer new customers. Demand for wide-flange structurals is exceeded only by consumer pressure for flat-rolled. Valuation of construction in southern California for first five months

of 1950 was 43 per cent higher than that for like 1949 period.

San Francisco—Volume of structural shapes is increasing as the building pace picks up. Public works remain heavy while private construction is showing improvement.

Seattle—Fabricators' backlogs will sustain current operations for sixty days, but forward business is lacking. Demand for small tonnages is steady. Tonnages are pending for several Alaskan projects for which general contracts have been awarded.

Stainless Steel . . .

Stainless Steel Prices, Page 124

Pittsburgh—Carnegie-Illinois Steel Corp. advanced stainless steel ingots, blooms, billets and slabs for rerolling, as well as tube rounds, 1 cent per pound, effective June 28, to reflect 8 cents per pound increase in nickel and advance in general manufacturing costs. Hot-rolled stainless strip was increased 1.25 cents per pound and all other stainless steel products, except stainless plates which remain unchanged, were advanced 1.50 cents. Stainless steel tubular products produced by National Tube Co. as well as cold-rolled strip and cold-drawn wire and bars produced by American Steel & Wire Co. also advanced 1.50 cents. This is first major price move in stainless taken by U. S. Steel subsidiaries since Aug. 9, 1948, and applies on all the various types of stainless steel produced.

New mill prices, in cents per pound, now quoted by Carnegie-Illinois for type 302 stainless steel follow: Ingots, rerolling, 14.50c; billets and slabs, rerolling, 19.25c; billets, forging, 25.75c; tube rounds, 29.50c; forged discs, die blocks and rings, 32.00c; hot-rolled and cold-finished bars, 30.00c; shapes, 30.00c; hot-rolled sheets, 39.00c; hot-rolled strip, 27.00c; cold-rolled strip, 34.50c.

Armco Steel Corp. advanced prices 1.50 cents a pound on stainless wire, bars, cold-rolled strip, forging billets and structural angles, while Firth-Sterling Steel & Carbide Corp. took similar action on its stainless steel products, including cold-rolled strip, bars and wire products.

Rails, Cars . . .

Track Material Prices, Page 123

New York—Award of 3000 freight cars by Union Pacific to its own shops last week saved June from being one of the poorest months this year. Preliminary estimates for June place total awards at 3607 cars. Little new business is in active prospect. Buying of diesel-electric locomotives continues active.

Export Pipe Prices Revised

New York—U. S. Steel Export Co., this city, has made the following revisions in export base prices with freight included to New York, Philadelphia and Baltimore, effective as of June 28. New discounts from list are: American standard pipe, T.&C., buttweld, 2½ and 3 in., black 42.4 per cent, galvanized 24.4 per cent; seamless, 3½ to 6 in., black 35.4 per cent, galvanized 16.9 per cent;

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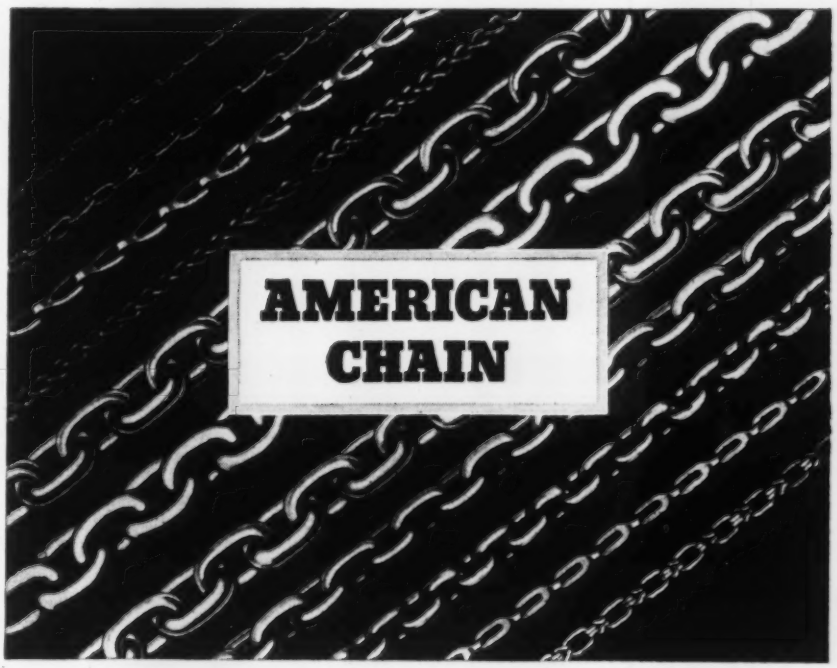

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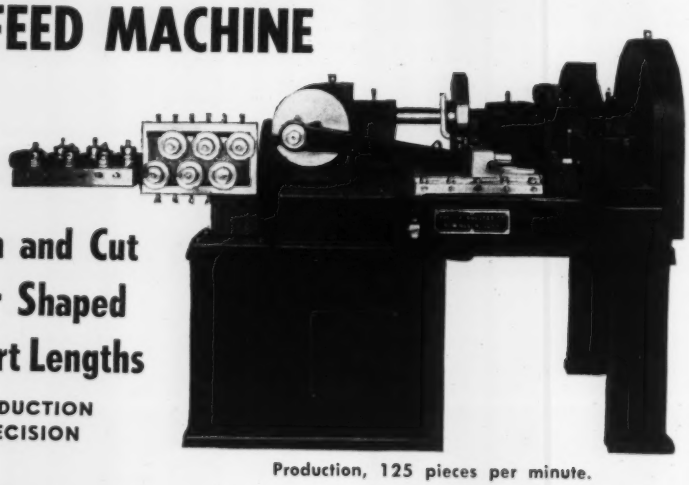

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These prices are net cash, subject to adjustment to seller's price in effect at time of shipment from the mill, and also subject to seller's current list of extras and deductions.

Tin Plate . . .

Tin Plate Prices, Page 122

Pittsburgh—Tin plate production schedules likely will be well sustained throughout vacation periods. Extremely heavy pressure for prompt deliveries to meet seasonal food pack requirements has prompted operating officials to work out various arrangements with mill crews to boost output. Tin plate output at Irvin Works of Carnegie-Illinois has been substantially reduced the past 10 days due to breakdown of two motor generators on the 5-stand cold-reduction mill. Loss in production is being partially remedied by shipping hot-rolled bands to Gary Works.

Pig Iron . . .

Pig Iron Prices, Page 120

Boston — Additional foreign iron has been bought by one steelworks, duplicating an earlier purchase of 10,000 tons of basic. Foundry melt is slightly heavier. Early July shipments are down, but last half of month will bring out more releases. Everett furnace will dip into inventory this month, but probably less than in last two months. Prices of Mystic iron remain unchanged for third quarter.

New York—Pig iron requirements this month and to a lesser degree in August will lag, due to suspensions at foundries for mass vacations. Buying is lighter also due to general easing in scrap compared with two or three weeks ago. Foreign iron is being received along the eastern seaboard in increasing volume. Iron is coming from Holland, Germany and Austria. Prices are higher as compared with a month ago, averaging about $41-$42, duty paid eastern ports.

Buffalo—Pig iron supplies continue to tighten as demand from foundries is increasing. Inquiries from Canadian foundries are being rejected because merchant iron stocks are not sufficient to meet immediate domestic demands, especially from motor casters.

Philadelphia—With many district foundries closing down this week for vacations and others planning similar action later on, the outlook is for a drop in pig iron buying. More casting orders are being placed so that the dip in specifications may not be as much as originally expected. Foreign arrivals are steadily increasing.

Pittsburgh—Jobbing foundries note continued improvement in order volume, but in many instances have delayed stepping up operations because of growing pig iron shortage resulting from relining of lone merchant foundry iron stack in this district. Scarcity of pig iron is partially offset through greater use of cast scrap, prices for which have advanced

slightly as a result. Captive foundries are active, notably those serving the enamelware and heavy industrial machinery industries.

Chicago—Carnegie-Illinois blew in its No. 4 blast furnace at South Works to bring number of furnaces in blast in the district to 39. Inland has switched its No. 2 stack to merchant iron for a campaign of about three weeks. Basic iron requirements for steelmaking prevent mills from producing much merchant iron for stock, although foundries generally are receiving enough metal for better than hand-to-mouth operations.

Cincinnati—Tonnage of pig iron moved into this district in June was heavier than in May. Prospects for July demand are bright despite occasional shipping delays because of vacations. Only a few melters are piling iron. Foundries are busier than earlier in the year but most of them are far from capacity heats.

Birmingham—Merchant iron producers are moving promptly all the iron they can turn out. However, scarcities are not marked.

Iron Ore . . .

Iron Ore Prices, Page 125

Cleveland—Lake shippers are pressing movement of ore from the head of the lakes but stocks at lower lake docks and furnaces are rising slowly because of heavy consumption.

Shipments for the week ended June 26 totaled 2,848,814 tons compared with 2,726,387 tons for the like 1949 week, bringing the cumulative total this season to 19,787,904 tons compared with 31,011,509 tons for the like period a year ago.

Consumption of iron ore in May amounted to 7,362,238 tons, according to the Lake Superior Iron Ore Association. This compared with 7,109,044 in April and with 7,276,719 in May last year.

Stocks of ore at furnaces at Lake Erie docks on June 1 were 14,384,443 tons, only about 300,000 tons more than on May 1. On June 1 last year stocks totaled 21,508,087 tons.

Warehouse . . .

Warehouse Prices, Page 125

New York—Distributors are falling far short of meeting demand for carbon sheets. Orders, normally placed with mills, supplement usual warehouse inquiry. Distributors' July and August allocations from mills have been cut back sharply in some instances. A price increase in galvanized nails is likely. Nail market is chaotic with prices under pressure from imports; nails are being sold at piers in 100-keg lots $20 to $25 per ton under warehouse cost price. Merchant steel pipe sales in June approximated a two-year high in some instances.

Philadelphia—Hill-Chase & Co., this city, long-time distributor of cold-finished steels and aluminum, are entering into the hot-rolled steel field. A 32,000 sq ft addition has been built to house the new items. Angles and channels, bars and beams, sheet and strip, plate and floor plate are among the new shapes carried. The new department is headed by Willard W. Kopf, who has 20 years' experience in this field.

Philadelphia—District warehouses anticipate a falling off in demand this month due to seasonal influences. June, however, held up very well in most cases. One large distributor reports an actual increase for that month, compared with May.

Pittsburgh — Daily average shipments from steel distributors' stocks throughout June recorded little change from preceding month, but were substantially above comparable period a year ago. Warehouse steel interests have not experienced marked gain in demand reported in other areas, since large portion of customers' requirements are centered in structural fabrication activities. Distributors soon are expected to adjust stainless steel prices upward in line with mill price action initiated by U. S. Steel Corp.'s subsidiaries last week.

Cincinnati — Warehouse stocks of steel are being bled to sustain deliveries against active demand. Sheets and plates continue scarce. A shortage in stainless has developed. Most orders for building steel is on small projects for which steel is available.

Los Angeles—June warehouse sales are at a record pace and 20 per cent ahead of those in May. Rising consumer requirements make unlikely any slackening of warehouse activity for the remainder of the year. On voluntary mill allocation for most steel products, distributors are

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Manganese content approximately 59%
Anaconda's production is the principal U. S. source of supply for metallurgical grade manganese ore. Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y., and Anaconda, Montana.
50373
ANACONDA
COPPER MINING COMPANY

Consolidated Vultee Aircraft Corporation

Silicone Rubber Solves Seal Problem on B-36

CONVAIR design engineers needed a rubber that would take a beating at –60° F. or below and still perform its operational function. Their problem was a durable seal for the bomb bay doors of the giant B-36.

An extruded section of Silicone rubber No. 250, fabricated by STALWART, proved to be the answer. With greater abrasion resistance than any other Silicone stock, No. 250 retains its rubber-like characteristics at temperatures ranging from –110° to 400° F. This special rubber and production know-how earned another "Mission Accomplished" for The Stalwart Rubber Company.

That's why leading manufacturers Specify Stalwart for Quality Custom Rubber Parts.

STALWART
RUBBER COMPANY
7167 Northfield Road
BEDFORD, OHIO

screening customers' orders to spread stocks around.

San Francisco—Hot-rolled product prices have advanced an average of $3 a ton on jobber lists. Turnover in June was active and, in some instances, the best in several months.

Seattle—June established the best record so far this year for warehouse volume. Demand for all out-of-stock items continues firm and steady. Stocks are well rounded, but mill deliveries for replacements are behind schedule. Some warehouses have limited stocks of galvanized sheets which they are rationing.

Scrap . . .

Scrap Prices, Page 128

Philadelphia—Steel scrap prices are nominally lower. No new consumer orders of importance have been noted and, in some instances, outpouring of scrap has been so heavy some shipments have been held up.

Korean crisis may also be exerting an easing influence on the scrap market. Should it result in another global war, one of the first moves the government would make probably would be to freeze orders and establish maximum prices which undoubtedly would be below current levels.

The leading eastern scrap consumer has purchased 135,000 tons of foreign scrap. Three shipments have been received and shipping charters have been obtained for seven additional cargoes, two of which are being loaded on the other side.

Pittsburgh—Mills remain out of the market on new scrap commitments. In many instances producers have been forced to hold up shipments due to the extremely heavy influx of material as a result of dealers and brokers rushing to cover commitments at higher price levels. At least one mill has purchased a small tonnage of good open-hearth grades at $41 from a metal working company that did not have an agreement based on published quotations. The market for No. 1 heavy melting steel is interpreted at about the $41 level on the basis of brokers' and dealers' buying price of $40 and small lots of distress tonnage from fabricators moving at $41 to the mills. Shortage of pig iron has strengthened prices of cast grades slightly, No. 1 machinery having sold at $43 to $43.50.

New York—Pre-holiday dullness marks the scrap market here. Consumers recently have bought little, and all appear well covered for the moment with back orders. Actually, shipments have been held up at some points. While making no change in No. 2 heavy melting steel, brokers have dropped their buying prices on No. 1 heavy melting steel and No. 1 bundles to $30-$31, f.o.b. shipping point; also on No. 1 busheling to $29-$30 and on No. 2 bundles to $24-$25.

Boston—Lower steel scrap prices have not stimulated buying, but the decline appears to have levelled off. Heavier grades are generally unchanged and lighter scrap is somewhat more in line with usual differentials. Cast scrap is slow and moving in small lots.

Buffalo — Scrap prices dipped cents to $1 last week as dealers expressed a willingness to do busine at lower levels, but mills refused t bid. The Korean situation caused a ditional jitters, mainly on the bea ish side. A return of governme price regulations is considered a for gone conclusion, if fighting becom widespread. Prices would be pegge traders believe, at levels considerabl below those now prevailing.

Cleveland—Very little buying is being done by consumers in this district, pending establishment of more stable price conditions and clarification of the Korean situation. Open-hearth grades are off nominally $1. Some tonnages are moving into the Valley, however, in addition to routine shipments on old contracts. Brokers anticipate continued heavy consumption of scrap over the balance of this year and believe mills will enter the market more actively later this month. One factor which will bolster the market is the fact that steelmaking will not drop during the vacation period as much as operations in scrap-generating industries. This will tend to restrict supplies during July and August.

Detroit—First of the automotive lists were of the smaller variety and brought steady prices. No test will be provided until closing of the larger lists which were of record proportions. This would augur lower prices, but the possibility of steel company buyers deciding to build up scrap inventories in view of the troubled international situation and the present more favorable price level would act to counterbalance such a movement. Broker sentiment, if anything, is on the bearish side, subject to change without notice.

Usual excitement accompanying the closing of heavy automotive lists was missing this month, and prices were somewhat weaker on the second day. No. 2 bundles are quoted off $1, as are busheling, machine shop turnings, short shoveling turnings and borings. Forge flashings are off $2, while the entire list of cast grades is weaker by $1.

Cincinnati—Price trend in scrap market continues downward, although quotations on railroad steel are holding pending imminent bids. Mills have not come into the market for July tonnage, but are assured of somewhat lower prices than recent peaks. Material is coming out freely.

Chicago—Major mills are taking No. 1 heavy melting at $38. Scrap in substantial quantity can be had at that figure. The selective rail strike is having no noticeable effect on yard or mill receipts in the area. Re-rolling rail market became easy with the news of foreign purchases and mills report they are swamped with offers at $48.

St. Louis—Scrap prices are holding just under recent peaks, while brokers await anticipated substantial mill buying. Dealers' incoming material and processing operations are falling off due to hot weather.

Birmingham—Scrap market is easier, although prices are unchanged. A considerable tonnage of agricultural scrap is coming into local yards.

Los Angeles — Steady buying by mills of domestic material and sma l

off-shore imports has left producers' yards well-stocked. Undertone of market is soft and lower prices for steelmaking grades are expected.

Canada . . .

Toronto, Ont.—Primary iron and steel shapes produced in Canada in March totaled 361,761 net tons against 320,213 tons in February and 354,527 tons in March, 1949. Shipments for sale in the month totaled 358,956 net tons compared with 198,347 tons in February and 262,513 tons in March, 1949.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7000 tons, Statler Hotel, Los Angeles, to Consolidated Western Steel Corp., that city.

5960 tons, Chrysler office building addition, 42nd St. and Lexington Ave., New York, through Turner Construction Co., that city, to the Bethlehem Steel Co.

1200 tons, warehouse, Burlington Mills, Teterboro, N. J., to American Bridge Co., Pittsburgh.

700 tons, Lerner store No. 500, New York, to Belmont Iron Works, Eddystone, Pa.

500 tons, addition to Security garage, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

475 tons, medical-surgical building, veterans' hospital, Salisbury, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.; Tompkins-Curlett - Wunderlich, Washington, general contractor.

450 tons, warehouse, Sears, Roebuck & Co., Boston, to Bethlehem Fabricators Inc., Bethlehem, Pa.

430 tons, Farnhurst interchange, New Castle, Del., to Bethlehem Steel Co.

354 tons, gymnasium, Wagner College, Staten Island, N. Y., to White Plains Iron Works, White Plains, N. Y.

180 tons, store, Lit Bros., Upper Darby, Pa., to Manuel A. Greenberg, Philadelphia.

165 tons, plant addition, American Brake Shoe Co., Oakland, Calif., to Gilmore Fabricators Inc., that city.

145 tons, school building, Clinton, Conn., to City Iron Works, Hartford, Conn.; Felix Buzzi & Son, Torrington, Conn., general contractor; Ceco Steel Products Co., furnishing 40 tons, reinforcing bars.

130 tons, state highway bridge, North Adams, Mass., to Bethlehem Steel Co.; Petricca Construction Co., Pittsfield, Mass., general contractor.

118 tons, state bridge, Clifton, N. J., to American Bridge Co., Pittsburgh.

115 tons, state highway bridge, Great Barrington, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; Petricca Construction Co., Pittsfield, Mass., general contractor.

100 tons or more, 140-ton gantry crane for McNary dam powerhouse to Willamette Iron & Steel Co., and Guy F. Atkinson Co., Portland, Oreg., low $194,629 to U. S. Engineer.

STRUCTURAL STEEL PENDING

5400 tons, Major Deegan state highway, 50-2, Bronx, New York, Johnson Drake & Piper Inc., that city, low on general contract, and Bethlehem Steel Co., Bethlehem, Pa., low on structural steel.

5347 tons, contract No. 37, New Jersey Turnpike bridge work, Union, Mercer and Middlesex counties, bids July 14; tonnage comprises 5100 tons of carbon steel and 247 tons of silicon steel; also required are 45,000 ft of steel for concrete bearing piles.

1200 tons, senior high school, East Providence, R. I.; bids July 13.

1200 tons, hospital, Harrisburg, Pa.; Ritter Bros., that city, low on general contract.

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1055 tons, contract No. 21, New Jersey Turnpike bridge work, between Allentown and Raritan river, in Mercer and Middlesex counties; bids July 12.

800 tons, Public School No. 109, Bronx, New York; bids July 7.

700 tons, Public School No. 192, Manhattan, New York; bids July 6.

350 tons, traffic interchange structure, James J. Storrow Memorial drive, Boston; Farina Bros. Inc., Newton, Mass., low $1,062,725.

250 tons, plus, four railroad and highway bridges, McNary dam relocation project; general contract to Utah Construction Co., Richmond, Calif., low $242,079, by U. S. Engineer, Walla Walla, Wash.

200 tons, ring gates, steel roof, decking, etc., for Hungry Horse dam, Montana; Puget Sound Bridge & Dredging Co., Seattle, and Truscon Steel Co., Denver, low $59,900 and $11,249, respectively, to Bureau of Reclamation, Denver.

138 tons, state bridge, Allegheny county, Pennsylvania; bids July 21.

125 tons, square span rolled beam overpass, East Hartford, Conn.; bids in.

Unstated, observation control towers, etc., for Atomic Energy Commission airport; bids to Commission, Hanford, Wash., July 19.

Unstated, machine shop, heating plant, etc., Coulee dam area; general contract to Morrison-Knudsen Co. and Peter Kiewit Sons Co., Seattle; low joint bidders $1,487,043.

Unstated, 125-ton gantry crane for Hungry Horse dam; Willamette Iron & Steel Co., Portland, Oreg., low to Bureau of Reclamation, Denver, $128,195.

Unstated, two sets, radial gates and hoists, Potholes East canal, Columbia Basin project; bids to Bureau of Reclamation, Denver, to be called about June 30.

Unstated, transmission tower steel; bids to Bonneville Power Administration, Portland, Oreg., June 28.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2440 tons, medical-surgical building, veterans' hospital, Salisbury, N. C., to Virginia Steel Co., Inc., Richmond; Tompkins-Curlett-Wunderlich, Washington, general contractor.

1900 tons, foundry and boiler house, contract B and C, Ford Motor Co., Cleveland, to Truscon Steel Co., Youngstown.

1513 tons, sewage treatment plant, Canton, O., to Pollak Steel Co., Cincinnati.

1500 tons, contract No. 38, New Jersey Turnpike, in Union, Mercer and Middlesex counties; bids July 14.

1500 tons, apartment building, Pittsburgh, to Jones & Laughlin Steel Corp., that city.

1133 tons, University of Chicago Argonne cancer research hospital, Chicago, to Concrete Steel Co., New York.

1000 tons, engine plant, Ford Motor Co., Cleveland, to Paterson-Leitch Co., Cleveland.

855 tons, memorial hospital, Westville, Ind., to United States Steel Supply Co., Chicago.

480 tons, contract No. 41, New Jersey Turnpike, Mercer and Middlesex counties; bids July 12.

476 tons, paving LR 86, Erie county, Pennsylvania, to Truscon Steel Co., Youngstown.

450 tons, sewage treatment plant, Mishawaka, Ind., to Ceco Steel Products Co., Chicago.

445 tons, contract No. 39, New Jersey Turnpike, Elizabeth, bids July 13; also required are 3500 ft of steel bearing piles or 3100 ft of cast-in-place bearing piles.

372 tons, Alcoa building, Pittsburgh, to United States Steel Supply Co., Chicago.

350 tons, contract No. 32, New Jersey Turnpike, Elizabeth, bids July 11; also required are 24,000 ft of steel bearing piles and 12,000 ft of pile coating or 24,000 ft of cast-in-place bearing piles.

340 tons, highway project 49, Cleveland, to Builders Structural Steel Co., Cleveland.

315 tons, sewage treatment plant, Port Jervis, N. Y., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; Westcott Construction Co., North Attleboro, Mass., general contractor; Builders' Iron Works, Somerville, Mass., furnishing 75 tons, fabricated structural steel.

290 tons, steam distributing tunnel, state hospital, Somerset county, Pennsylvania, to Lind Steel Co., Pittsburgh.

260 tons, junior high school, Freeport, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

250 tons, Union Railroad viaduct, Turtle Creek, Pa., to United States Steel Supply Co., Chicago.

221 tons, state hospital, Hollidaysburg, Pa., to Bethlehem Steel Co.

200 tons, addition, Thayer hospital and Mansfield clinic, Waterville, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.; H. P. Cummings Construction Co., Ware, Mass., general contractor.

175 tons, interceptor sewer, Dayton, O., to Pollak Steel Co., Cincinnati.

160 tons, reservoir and dam, Mill Creek, O., to Ben-Tom Supply Co.

145 tons, Edgewater Tower apartments, Lakewood, O., to United States Steel Supply Co., Chicago.

121 tons, paving LR 72, Butler county, Pennsylvania, to Bethlehem Steel Co.

115 tons, Rosary College, River Forest, Ill., to Ceco Steel Products Co., Chicago.

110 tons, high school, Brilliant, O., to Pollak Steel Co., Cincinnati.

105 tons, hospital, Cambridge, O., to United States Steel Supply Co., Chicago.

105 tons, state project 4208, Marshall, Minn., to Hassenstein Steel Co.,

100 tons, St. Casimirs Academy, Chicago, to Concrete Steel Co., New York; also 250 tons of steel joists to Truscon Steel Co., Youngstown.

100 tons, Southern Cotton Oil Co., Chicago, to Truscon Steel Co., Youngstown.

REINFORCING BARS PENDING

1005 tons, traffic interchange structure, James J. Storrow Memorial drive, Boston; Farina Bros. Inc., Newton, Mass., low $1,062,725.

525 tons, NACA equipment storage building, Cleveland; bids asked.

350 tons, motor truck building, International Harvester Co., Ft. Wayne, Ind.; bids asked.

300 tons, high school and convent, Wauwatosa, Wis.; bids asked.

300 tons, sewage treatment plant, Altoona, Pa.; bids asked.

295 tons, Calumet intercepting sewer 13A, S. Holland, Ill.; bids asked.

215 tons, St. Lukes hospital, Davenport, Iowa; bids asked.

200 tons, Soda Lake headworks, Columbia Basin project; Scheumann & Johnson, Seattle, apparently low, $382,068.

200 tons, garage, Board of Education, Detroit; bids asked.

178 tons, state bridge, Allegheny county, Pennsylvania; bids July 21.

171 tons, highway bridge, Miami county, Ohio; bids asked.

160 tons, viaduct, Shelton-Derby-Ansonia expressway, Derby, Conn.; bids in.

115 tons, new roadways and connections to Harvard bridge, Boston; bids in.

108 tons, generating plant, Humboldt, Iowa; bids asked.

100 tons, factory addition, Motor Products Corp., N. Chicago, Ill.; bids asked.

Unstated, underpass at Malta, 324-foot steel concrete bridge, etc., Montana state highway projects; bids to Helena, June 29.

Unstated, Oregon state highway projects including 240-foot bridge, Clatsop county; bids to Portland, July 10.

PLATES . . .

PLATES PLACED

2305 tons, seven tanks, Cities Service Corp., New York, for construction at various points, to Bethlehem Steel Co.

374 tons, one tank, Shell Oil Co., Rensselaer, N. Y., to Bethlehem Steel Co.

PLATES PENDING

500 tons, 23,400 ft 36 in., ¼ inch, supply water line, also couplings, etc.; bids to G. W. Yates, purchasing agent, Portland, Oreg., July 11.

200 tons, 500,000-gallon standpipe, Fort Lauderdale, Fla.; bids July 10.

100 tons or more, steel piling, Soda Lake headworks, Columbia Basin project; Scheumann & Johnson, Seattle, apparently low.

PIPE . . .

CAST IRON PIPE PENDING

1200 tons, 51,000 ft, 6 and 12-in., Metropolitan District Commission, Hartford, Conn.; Warren Pipe Co., Everett, Mass., low.

100 tons, 6 in. and pipe fittings; bids to King County district No. 42, Seattle, June 30.

Unstated, 12 to 6 in supply lines; bids to Medford, Oreg., July 5.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chesapeake & Ohio, eighteen 1600-hp diesel-electric road switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Royal State Railway, Thailand, 45 diesel-electric locomotives, to Davenport Besler Corp., Davenport, Ia.; of total 15 are to be 78-ton units equipped with two 500-hp caterpillar engines and 30 are to be 53-ton units equipped with one 500-hp caterpillar engine.

Seaboard Air Line, fourteen 1000-hp diesel electric switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

RAILROAD CARS PLACED

Canadian National, three depressed center 60-ft flat cars, to Canadian Car & Foundry Co., Montreal.

St. Louis-San Francisco, 95 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Railway subsidiaries, 250 covered hopper cars, to Pullman-Standard Car Mfg. Co.'s plant at Bessemer, Ala.

Union Pacific, 3000 freight cars, comprising 2500 all-purpose box cars and 500 stock cars, to its own shops at Omaha, Grand Island, Nebr., and Denver; most of the heavy parts have been purchased from more than a dozen car building companies.

RAILROAD CARS PENDING

Baltimore & Ohio, 150 to 200 perforated auto box cars; reported pending.

Detroit, 40 trolley busses, bids asked.

FERROALLOYS

(*Continued from Page 125*)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., SMxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

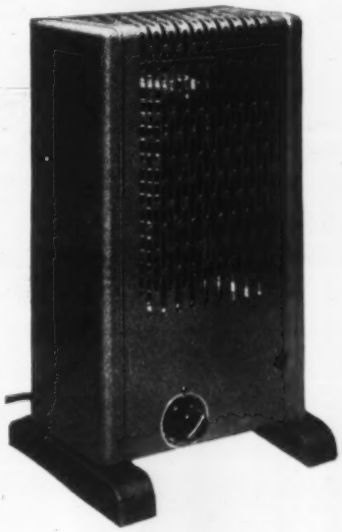
Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium.



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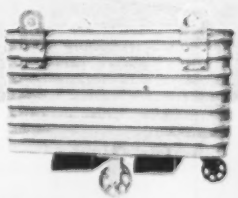
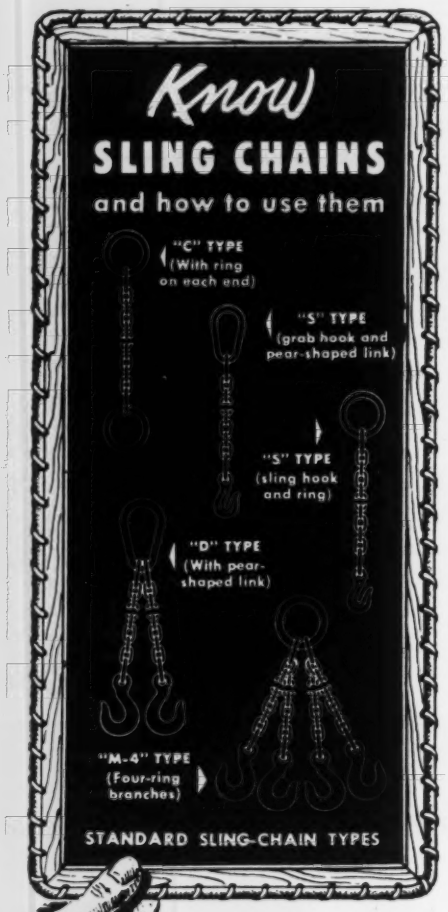


Roll over caster box designed and built by Powell has floor mobility plus stacking and fork truck dumping features.



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ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon. Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.), contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn. $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb. contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

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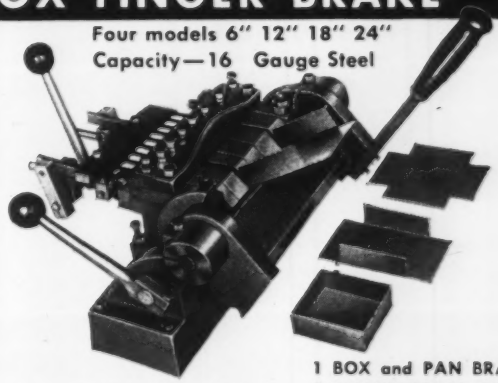

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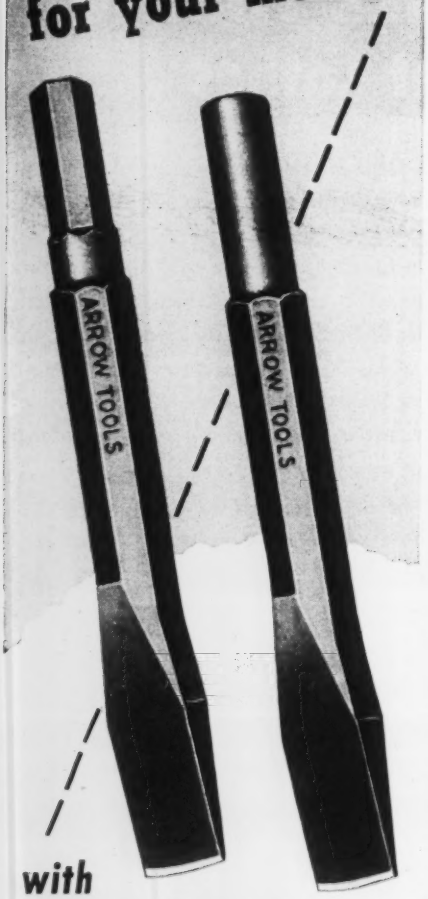

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

California

Berkeley Scientific Co., maker of specialized electronic and research equipment, started construction of a new plant in Richmond, Calif.

California

Entire capital stock of **Saval Inc.,** manufacturer of high pressure fluid control valves, was acquired by **William R. Whittaker Co. Ltd.,** manufacturer of aircraft valves, both of Los Angeles. The two organizations will carry on separate manufacturing and sales operations.

California

Consolidated Vultee Aircraft Corp., San Diego, acquired exclusive rights to the Charactron tube which can be used for visual message presentation in aircraft. Other applications include its use in electronic equipment for ultra-high-speed transmission of signals, messages, and data, and for high-speed printing in connection with computers.

Delaware

Wolfcarb Bit Co. of United States Inc.—machinery—was chartered by the corporation department of the secretary of state's office, Dover, Del. Capital of the firm is listed at 100 shares of stock, no par value. **Corporation Service Co.,** Delaware Trust Building, Wilmington, Del., is the principal office.

Idaho

Food Machinery & Chemical Corp.'s Westvaco Chemical Division, New York, will build a third electric furnace for manufacture of elemental phosphorus at its plant in Pocatello, Idaho. The Westvaco division also will construct a new phosphorus processing plant at Lawrence, Kansas. **Bechtel Corp.** will design and construct both units, which are scheduled for completion late in the spring of 1951.

Illinois

Burgess-Parr Co., Freeport, Ill., changed its name to **Illium Corp.** because of the close association of the company with its principal product. Illium, a corrosion-resistant alloy.

Illinois

Chicago Metallic Mfg. Co. organized a subsidiary, **Pan Coatings Inc.,** to enter the pan glazing field with offices at 3711 S. Ashland and a plant at 618 W. Pershing, Chicago. Jerome H. Debs is president of the parent and subsidiary companies.

Maryland

Proctor Electric Co., Metal Division, Philadelphia, has equipped a division of its plant in Arbutus, Md., for the manufacture of a special switch used on electric ranges.

Maryland

Custom Steel Metal Co. established a plant at 2201 Boston St., Baltimore, to engage in sheet metal business. E. H. Mathanen is owner.

Maryland

Johnson & Schalla Metal Products Inc. established a plant at 2324-2326 Boston St., Baltimore, containing several thousand square feet, for the manufacture of metal kitchen cabinets. Brooke K. Johnson is president; Johann Challa, vice-president.

Maryland

John Adams Co., 2624 Boston St., Baltimore, machine and blacksmith shop work, entered the field of general machine shop business. For many years the company was engaged almost exclusively in the manufacture of oyster dredging equipment.

Maryland

Fairchild Engine & Airplane Corp., Hagerstown, Md., changed the name of its Ranger Engines Division to Fairchild Engine Division, Farmingdale, Long Island. The division is engaged in the development of various types of jet engines.

Maryland

American Radiator & Standard Sanitary Corp., 5315 Holabird Ave., Baltimore, leased 17,400 square feet of space in the Colgate warehouses of **Canton Co.** for storage. James F. Toy is manager.

Massachusetts

Bay State Abrasive Products Co., Westboro, Mass., appropriated $250,000 for plant and equipment expansion, the second expenditure for that amount within one year for larger and more efficient facilities.

Michigan

Blackmer Pump Co., Grand Rapids, Mich., appointed as distributors: Blott-Robb Co., Transmission Machinery Co. and Amco Corp., all of Chicago; H. O. Link Co., Baltimore; Tri-State Equipment Co., Kansas City, Kans.; Avels Sales & Engineering Co., Indianapolis.

Michigan

Catalytic Combustion Corp., 4544 Grand River Ave., Detroit, was organized to design and manufacture catalytic elements for use in fume incinerators and other air pollution control devices. Manufacturing facilities are in Wisconsin while the sales office is in Detroit. Officers are: R. J. Ruff, president; H. R. Suter, vice president; N. C. Ruff, secretary-treasurer.

New Jersey

Sale of the **Newark Steel Drum Co.,** Linden, N. J., to a group of former associates and others was announced by Clifford J. Colville, president and founder, and his brother, Wilbur E. Colville, vice president. The same company name will be retained.

New York

Jones & Laughlin Steel Corp. moved its New York offices from 230 Park Ave. to the Chrysler Bldg., 42nd street and Lexington avenue.

New York

Armco Steel Corp. moved its New York offices from 120 Broadway to the Chrysler Bldg., 42nd street and Lexington avenue.

New York

Federal Machine & Welder Co., Warren, O., appointed **Carbet Inc.,** 111 Broadway, New York, its eastern representative.

New York

Bridgeport Chain & Mfg. Co., Bridgeport, Conn., appointed **American Steel Export Co. Inc.,** New York, as its export representative. Bridgeport Chain, producer of chain, fittings and wire specialties, is a Round Associate Chain company.

Ohio

Majority control of **Ironton Engine Co.,** Ironton, O., was purchased by

Jones

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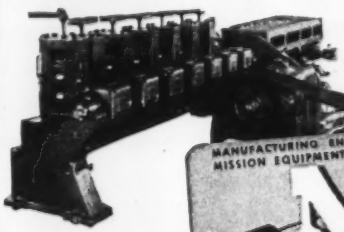

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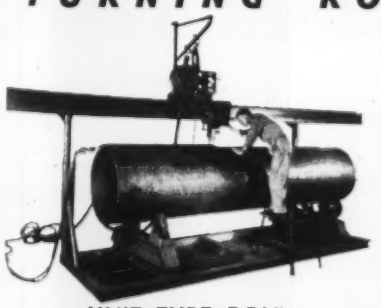

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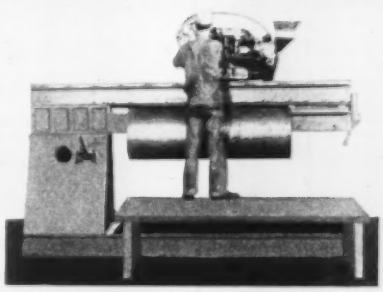

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